A Database Publication

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Vol. 2 No. 2 June 1986 £1

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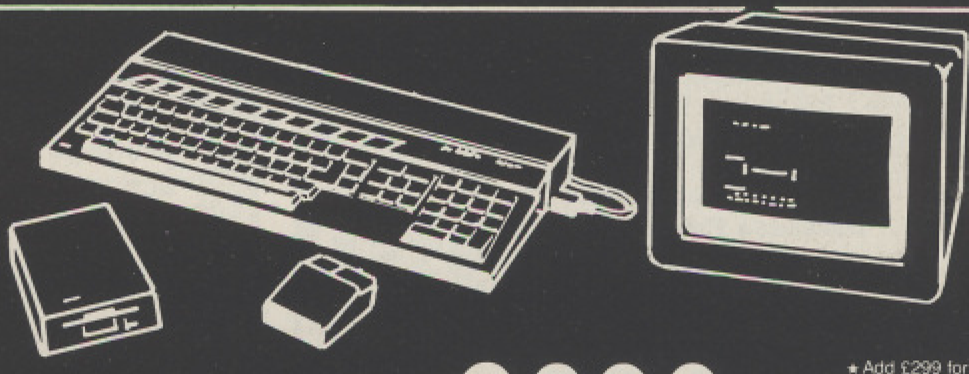
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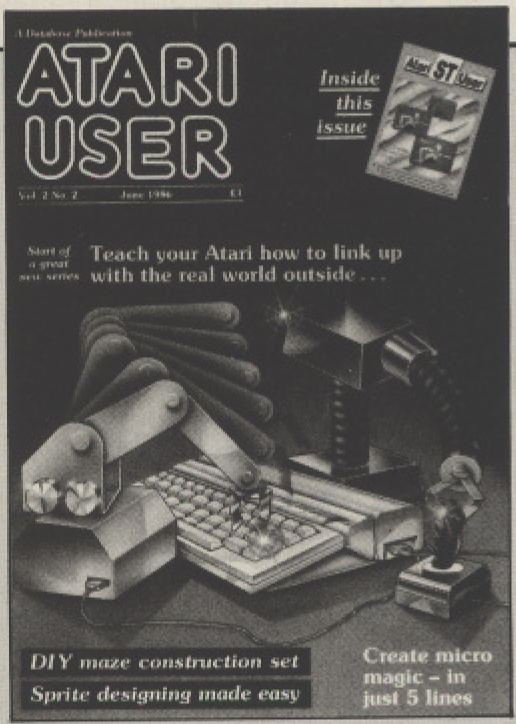
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Vol. 2 No. 2 June 1986

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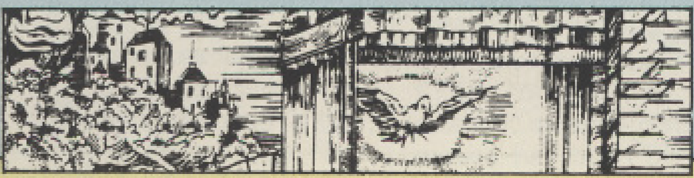




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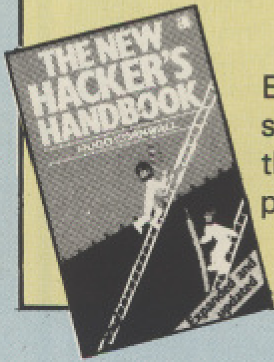








GAMES

THE NEW HACKER'S HANDBOOK






Vol. 1 No. 4
June 1986
Atari ST User
Android
How to make the most of ST graphics
● Double your 520ST's memory: Two techniques reviewed
● Revealed: SOUND advice missing from the ST manual
● Use your mouse to escape from the cunning 3D maze

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## Art and the ST

BEING developed by Andromeda Software for release by Mirrorsoft next month is ST Art. This paint program will handle both graphics and text, produce an A4 printout for instant leaflets, and offer a cyclical display facility with simple animation.

It will be compatible with the ST version of Mirrorsoft's personal publishing package Fleet Street Editor, due to be launched in September.

No price has been set for this latter package, but it is likely that two versions will be published – a full-blown professional program and a cut down version for the home, education and small business market.

Also promised by Mirrorsoft for the ST are Strike Force Harrier and Spitfire 40 for flight simulation fans.

## Accounts suite

A SUITE of integrated accounting software for the Atari ST range has been released by Systematics International Microsystems.

The range includes General Ledger and Financial Planning, Sales Ledger, Purchase Ledger, Invoicing, Stock Control, Payroll and Job Costing.

Prices range from £250 to £450.

# EXIT THE 520ST PACKAGE

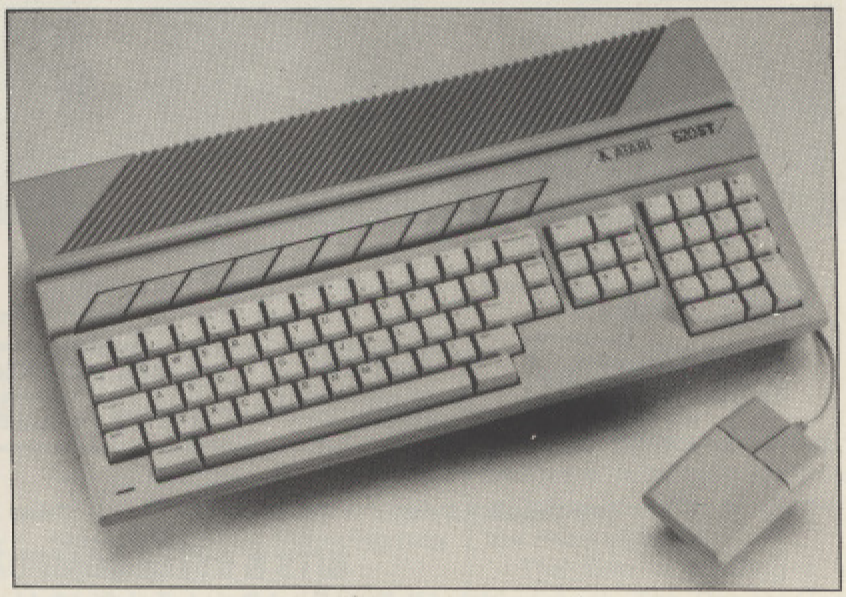
**THE 520ST-based computer package that spearheaded the rebirth of Atari under Jack Tramiel has been phased out.**

Having served its purpose of achieving a foothold in the UK serious user market, the original £749 configuration of micro, monitor, external disc drive and mouse has been overtaken by the new breed of Atari technology.

This includes the 520STM, 1040STF and the soon-to-be-available 520STFM.

Since the basic 520ST would be of little use without its own monitor, the 520STM includes a modulator which allows connection to a domestic television set.

The £399.99 520STM will still run with either a monochrome or an RGB colour monitor, and can be connected to a composite colour monitor such as a TV with a video input socket.




## Making way for new breed

Although the operating system – TOS/GEM – is now provided in ROM, you must now buy an external disc drive to actually do anything with the machine – unless you want to wait for the new cartridge-based software to be released.

Atari's 500k drive, originally supplied with the 520ST, costs £149.99 and the 1mbyte version £199.99. Alternatively, Southend-based AST has produced an ST compatible 1mbyte drive for the surprisingly low price of £99.

There is still no information as to when the 520STFM with built-in disc drive will be available, although a price of £499.99 has been announced.

For those who still want to buy a bundled machine at an all-in price, Atari's 1mbyte monster with a built-in 1mbyte drive – the 1040STF – is available with a monochrome monitor at £799, or with an RGB colour monitor at £999.

# ATARIS IN YOUTH TRAINING DRIVE

THE proceeds of a lost property sale by police has helped buy Atari machines for a youth club project.

One of the computers, an Atari 130XE, was taken from the Honor Oak Youth Club, Lewisham, and used for demonstrations at a national conference on computer work in the Youth Service aboard the Royal Princess on the Thames.



*Atari in use at the conference*

The club's senior youth worker, Mike Fordham, said: "We have four Ataris – two 800XLs, a 130XE and a 520ST with disc drive – all bought by donations from friends of the club, Inter-Action – an educational charity – and local police after their lost property sale.

"The conference strived to show how youth clubs now need computers to train youngsters ready for this new age of technology. I think within the next five years no one will even be able to get a job stacking shelves unless they can use a computer".

Atari has already funded the buying of machines for youth clubs and in the past also loaned 100 800XLs for use at community camps.

The company also donated two 800 XLs to Inter-Action and Community Computers UK, who help link organisations to potential backers.

The Ataris are helping transform Britain's youth clubs into job springboards, according to Ed Berman, founder of Inter-Action, an educational, non-profit making charity, which aids clubs and organisations.

● The Department of Education and Science has just announced a £75,000 grant over the next three years to Inter-Action for their youth club computer projects.

# BIG BOOST FOR ATARI SOFTWARE

**FOLLOWING major deals with two top independent software houses a new series of Atari ST adventure games from Rainbird Software is in the pipeline.**

The recently-released The Pawn is one of seven disc-based adventures to be written for Rainbird over the next two years by Magnetic Scrolls.

Level 9 Computing has also signed an agreement to provide three Rainbird products for the Atari ST over the coming year.

After meeting program authors from the two companies publisher Tony Rainbird said: "Part of the Rainbird expansion will involve reversing the current trend of imported American software, to which end we have already made a considerable impression on the American market with British games and utilities".

Magnetic Scrolls' commitment will give Rainbird world marketing rights for a further six new games after The Pawn, starting with The Guild of Thieves, available in the autumn. All programs will be disc based and 16 bit versions will feature "stunning" illustrations.



Anita Sinclair, managing director of Magnetic Scrolls, said: "This agreement with Rainbird enables us to continue our research into natural language and other artificial intelligence-related projects".

Level 9's deal was signed by Peter Austin, one of the partners in the brothers-and-sister company. He said: "We expect a substantial increase in adventure playing and Rainbird is prepared to support our products in a unique way".

Rainbird will initially market Level 9's re-written Colossal triology – Colossal Adventure, Dungeon Adventure and Adventure Quest – as a disc at £19.95 for the Atari ST and a triple cassette at £15.95 for the 8 bit machines.

A second multi-load adventure, provisionally called Knight Orc, is due out in September, with a third, probably a three-cassette package, following two months later.

● Picture shows Rainbird's adventure teams (left to right) the Level 9 brothers-and-sister team of Mike, Peter, Nick and Margaret Austin, Mike Clark, Tony Rainbird and Paula Byrne of Rainbird Software and Ken Gordon and Anita Sinclair of Magnetic Scrolls.

## Tips for authors

GAMES publisher Superior Software is looking for people with new ideas for programs for the Atari range.

The firm is offering a free guidebook, Top Tips for Games Authors, which contains general advice about selecting suitable software publishers and writing games software.

Sales manager Ken Campbell says: "The rewards for games authors can be enormous.

"Tim Tyler, one of our authors, who is only 17, has amassed more than £35,000 in royalties over the past year and that figure is still increasing week by week".

## Single handed joystick

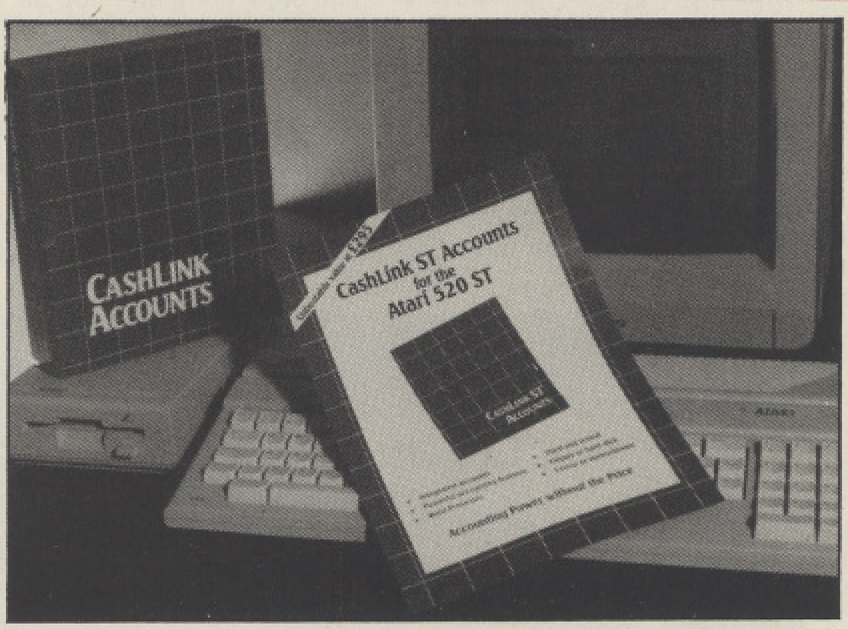
TWO new joysticks for the Atari games machines have been launched by Palan Electronics.

The Fantastic III has rapid-action dual electronic fire buttons suitable for both left and right handed players.

It also has eight directional movement with auto-centering and auto-fire control and comes with a two metre cord. Price: £6.95.

The Quickshot II Plus has microswitches with auto-fire capability and two fire buttons so users can shoot with thumb and trigger finger. The mechanism can be locked to allow a continuous burst of bullets.

Single-handed video game play is possible with the Quickshot II Plus as a result of the built-in suction cups. It costs £12.95.




## ACCOUNTS ON MENU

A NEW version of CashLink Accounts has been produced by CashLink for the Atari 520ST.

The program, designed for small to medium-sized businesses, takes advantage of windows and pull-down menus.

It offers a complete accounts department, handling all credit accounts and cash sales, with full accounting ledgers and records of stock.

CashLink Accounts costs £295. A full accounting package with Atari 520ST, disc drive, monitor, printer and accounts program is offered at £1150.

## ATARI'S ST PRINTER

ATARI has launched the first of its own range of printers for its ST computers.

The SMM804 dot matrix 80 column printer introduces a new line of high speed printers that will be of integrated design to complement the 16 bit ST range.

Rob Harding, Atari UK's marketing manager, said: "It is our intention to become the major supplier of all kinds of printers including the daisywheel, dot matrix and laser models during the next 12 to 18 months.

"They will all be priced at affordable levels in order to sell in substantial volumes".

The SMM804 costs £199.

# Budget Gold

A GAME that cost almost £30 when it was first imported from the USA is now on sale for just £2.99 for the Atari 8 bit machines.

Shamus, an all action adventure, is one of four bargain priced arcade games from America now being sold under licence by US Gold in Britain.

The Americana series also includes New York City, where dangers lurk at famous landmarks, Scooter, a multi-level three dimensional game, and Ollies Follies with 16 screens of action-packed challenges.

All cost £2.29, and are available on cassette only.

# Inside the ST

THREE new books for the Atari ST user come from First Publishing.

The Anatomy of the Atari ST includes detailed descriptions of the sound and graphic chips, internal hardware and a fully documented BOS assembly listing.

Gem on the Atari ST gives information on the Gem operating system in easy-to-follow language.

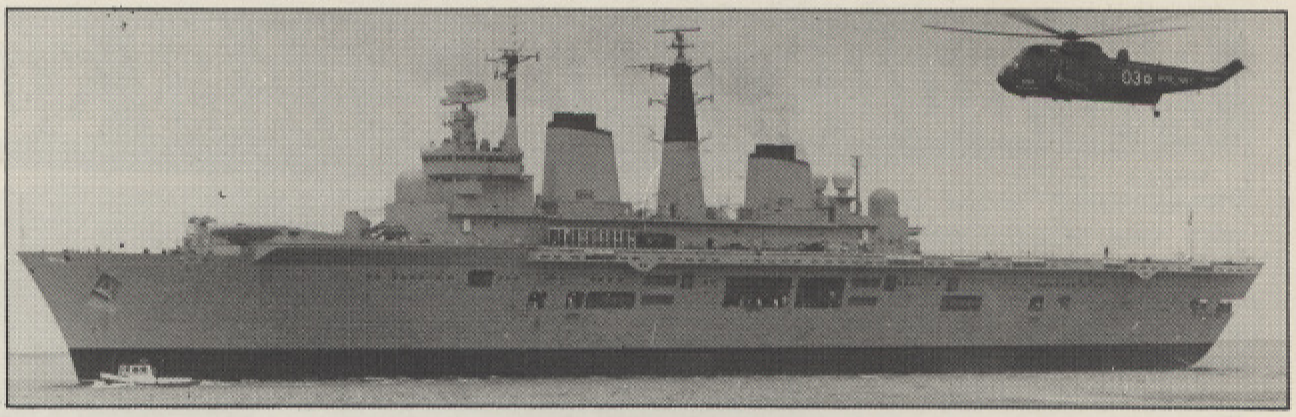
Atari ST Tricks and Tips explains basic commands to access Gem using VDISYS and GEMSYS and describes resource files with examples.

Each book costs £12.95.

# Bugs menace

GERM warfare is the theme of Firebird's Atari 48k release, the Comet Game. It comprises three phases in which there is just one chance to save the world from germ bags that infect a look-alike Halley's Comet.

The aim is to hit enough of the germ bags to stop a colony reproducing and infesting the earth's surface. Price £7.95.



# ATARI WILL BID FOR NAVY CONTRACT

**ATARI will be competing when tenders are invited by the Royal Navy to supply standard micros for floating classrooms for its junior officers and young sailors.**

Britain has had to double the number of sailors in sea-going jobs, cutting the time spent in educational training ashore.

Some warships have a variety of computers bought from ship's funds for study and recreation, as well as the officially installed computers needed for analysis of performance of missiles, guns and other weapons.

But the Royal Navy wants a standard machine capable of helping sailors' basic education in mathematics, English and other subjects, as well as professional courses previously taught ashore.

The idea is that by providing a standard computer a step-by-step teaching system can be worked out so sailors can learn either computerised operational work or CSE and GCE subjects at their own pace and be able to go back over parts they do not understand.

A Ministry of Defence spokesman told *Atari User:* "It is the intention to purchase a standard computer for all our ships for the education of sailors and junior officers afloat. But what type of computer will be installed will of course depend on the competitive price of the tenders".

The Royal Navy at present has 25 submarines, three aircraft carriers, 14 destroyers, four Fleet tender training ships, an ice-patrol vessel, eight survey ships, and a number of frigates, which would all need computers – the larger vessels requiring many additional machines.

Rob Harding, marketing director of Atari, said: "We are very interested to hear about this opportunity to provide computers for the Royal Navy.

"The ST range offers unbeatable value both in price and performance and is also very flexible.

The ST is proving very popular at all levels of education and should suit them perfectly.

"A number of educational packages will be ready for the ST in the near future".



Part of Twillstar's new showroom

# Business is booming

MORE than £400,000 has been invested by distributor Twillstar Computers to improve its services for Atari users.

Over the last three years business boomed so much at its West London shop – just 750 sq ft – the company was forced to move to larger premises.

In two months two buildings covering 7,000 sq ft in Southall have been converted into a well-stocked warehouse and extensive showroom.

Sevy Dhesi, managing director, said: "The Atari ST range brought about increased sales".

MicroLink
in association with
TELECOM GOLD

No. 10 June 1986

# NEWSLETTER

## MICROLINK TRANSFERS SPACE PROBE DATA

MICROLINK has been chosen to provide vital transatlantic communications for a project that will eventually push back the frontiers of space even further.

An organisation called Astra – Association in Scotland To Research into Astronautics – is experimenting with the design of a spacecraft that could travel millions of miles hopping from planet to planet and still survive a close encounter with the sun.

It is based on a concept known as Waverider, originated 20 years ago at Glasgow University by Professor Terence Nonweiler, where the vehicle flies at hypersonic speeds on the shock waves produced by its leading edges.

The project has attracted the attention of the Jet Propulsion Laboratory of the University of California which is working with NASA on Starprobe, a mission to fly within two miles of the sun.

The Americans see Waverider as the most serious contender for the role of Starprobe transporter because it can travel far into space by leaping from one planet to another, harnessing the gravitational force of each in the manner of a slingshot.

A leading member of the Starprobe team, James Randolph, has been to Scotland to see the work in progress. "Waverider is an ideal solution, perhaps the only one, to the problem of finding a vehicle with a high lift-to-drag ratio", he said after his inspection.

MicroLink's role in the project is to act as a fast and efficient medium for transmitting information from Astra in Scotland to the Jet Propulsion Laboratory in California.

"Wind tunnel test data and other data are constantly being assimilated and have to be passed on to JPL as soon as possible. Therefore we have turned to MicroLink as a cost-effective and rapid means of data transfer", said a spokesman.

## Menu for a good night out

ALL the world's a stage, and nowhere more so than London where theatregoers have a choice of over 40 glittering shows.

Now, in association with renowned booking agency Edwards & Edwards, MicroLink can reserve your seat in the stalls at any of them.

TheatreLink is a new service from MicroLink incorporating every play, musical, thriller, comedy and opera – plus major reviews and cabarets – being presented in the capital.

This cornucopia of entertainment ranges from the evergreen The Mousetrap, through old and new favourites like Blithe Spirit, Cats and Run For Your Wife, to the new musical Time.

To help you make your choice, the menu not only gives a full alphabetical list of every show currently running in London but also breaks it down into categories such as musicals, plays, comedies, thrillers and so on.

And as well as performance times and seat prices, each individual show listing contains the names of the stars appearing and a helpful description of its theme.

Bookings on TheatreLink can be made 24 hours a day, seven days a week up to the day before the performance you wish to attend. Seats for Friday and Saturday performances must be booked at least two days in advance.

Reservations will be confirmed on your mailbox within an hour if you book between 10am and 4.30pm, Monday to Friday.

Tickets will be charged to your credit card and either posted to you on the same day or held at the box office of the appropriate theatre.

TheatreLink is menu driven for maximum user-friendliness and also incorporates a section giving all the latest show news and a breakdown of which theatres still have seats available for performances during the current week.

## Airlines guide goes on-line

*AIRLINE travellers with a subscription to MicroLink have entered an era of trouble-free and more economical flight arrangements.*

*The reason is that MicroLink now provides instant round-the-clock information from the bible of globetrotters, the International Official Airlines Guide.*

*Known as OAG, it offers the very latest data from more than 750 airlines world-wide, with details of $1\frac{1}{2}$ million flights.*

*MicroLink subscribers can be connected within seconds via satellite to the OAG computer in Oak Brook, Illinois, which monitors the 38,000 changes in fares which take place daily, and the 30,000 weekly schedule revisions.*

*And OAG is a real money-saver because all the fares for each airline on any given route are accessible from the lowest to the highest.*

*The service also boasts an elapsed time feature which takes into account any stopover time during flights, thus enabling the passenger to select the journey with the shortest possible duration.*

*The OAG service is easy to use. It will accept full spellings or airline codes of destinations, and the user can select information either by single line entries or by using prompts on the system.*

YOUR chance to join MicroLink – Page 39

# American $cene

**EDWARD SHARK reports**

NEW York, New York, so good they named it twice! This is a debatable fact for those who have spent any time there, but one good thing to come from the Big Apple is Philon. It's one of the most professional of the software houses currently writing for the ST.

Two products have emerged from this company – Henry's Fundamental Basic and Fast/Basic M. The former is an introductory language which can be used by first time users through to advanced Basic programmers.

The package contains a whole host of built-in features but, more importantly, it is upwardly compatible with the second package.

Fast/Basic M is Microsoft MBasic compatible, which means that programs can be transported from other micros. The two packages represent a strong opposition to the current Atari ST Basic and the price will not break the bank. Henry's Basic will retail for £49 and Fast/Basic M for £99.

Philon also plan three more titles to add to the ST library – Fast/C, priced at £125 and Fast/Fortran and FastCobol at £249.

The graphics aspect of the ST is an exciting area for many people. The sheer resolution of the ST graphics handling makes the machine a must for creative people. Degas was the first to illustrate the power of the machine's graphic capabilities, and we are now starting to see more graphic packages arrive on the scene. Xlent Software has produced three, one of which, Typesetter, claims to be the perfect tool for layout and design. I found it interesting in as much as you can load Degas pictures into the program and reduce or enlarge them and add text. At £39.95 it represents a good utility to use alongside Degas.

Moving on to the real professional programs we find Easy-Draw from MiGraph which is truly excellent. If you have ever had the good fortune to see Gem Draw this package will amaze you.

You can create floor plans, landscape design, architectural designs, or simply draw pretty pictures. The printed results are very good, with the ability to print either a landscape picture or a portrait.

Apart from owning a 130XE and a 520ST, I also admit to an IBM XT. Until recently the IBM was very useful because, in the course of my working week, I need a very powerful relational database. DBase II did the job excellently – until I received a package from a company called Holmes and Duckworth.

H & D Base is basically DBase II, but for the 520/1040ST. You can even run DBase II files created on another machine without any alterations. It retails for £99.99, and should turn out to be the software package of the year for the serious business user.

For the 8-bit Atari, Origin Systems has at last released the long awaited sequel to Ultima III. Not surprisingly it is called Ultima IV. The game claims to be 16 times larger than its predecessor and takes up four disc sides.

Inside the packaging you will find the discs, a book on the history of the kingdom of Britannia, another on the Mystic Wisdom of the game and a very informative players reference guide. The nicest touch to the whole package is the map, which is printed in full colour on cloth and looks rather nice on my wall. It will doubtless be available within the next few months from US Gold, but do not expect all the refinements that come with the US version.

The American Civil War is the topic of SSI's latest contribution to the world of the strategist. Battle of Antietam for the 8-bit Atari is set in Maryland on the day the battle took place between Robert E. Lee and his army of North Virginia and the army of the Potomac lead by General George McClellan. The simulation is up to the usual SSI standards and retails for £39.95.

If you read last month's column you might remember a company I told you about called Hippopotamus. Well, I have received another Hippo package for the ST called HippoConcept which is an outline and idea processor.

Imagine you are preparing notes on a subject but do not have the time to elaborate on those notes at the time you record them. When you come back to them, the program will allow you to elaborate and format them into an orderly manner, adding, deleting and editing as necessary.

It is difficult to explain the full working details of the program in a few words but, for the person who likes to put his or her ideas down on the spur of the moment, and make sense of them at a later date, this package will certainly help.

When it comes to arcade games and the like my interest begins to fail. On the other hand, I do enjoy a game where you are not tied down to speed and joystick ability. Word for Word is for me. Copyright and trademarks prevent the authors, Bay View Software, from calling it by the name I do, and that is Scrabble.

This is possibly the best version of the famous board game produced for any computer. I don't need to say much more, apart from the fact that when used on the ST the mouse is invaluable. The price of the game in the UK will be £39.95.

I have just finished reading the American magazines Antic and Analog, and I am pleased to say that the products reviewed in their latest issues are ones that *Atari User* covered some time ago!

It is nice to find that a British magazine is more up-to-date on American products than the Americans themselves, and you can read *Atari User* for a third of the cost of our American cousins.

Until the next time.

# Classy classic




*Program: The Tail of Beta Lyrae*
*Price: £9.95 (cassette), £14.95 (disc)*
*Supplier: Databyte, Suite 31A Grove Terrace, Highgate Road, London NW5 1PL. Tel: 01-482 1755*

DESPITE its novel title, The Tail of Beta Lyrae turns out to be none other than a cloned version of Skramble, a game that first saw the dim light of an arcade about three or four years ago.

Basically the game consists of flying a fighter spacecraft through a series of caverns. The happenings on screen are displayed in standard two-dimensional, cross-sectional mode. Your view is from the side.

The spaceship flys from left to right through the caves but can accelerate or decelerate, and can move up and down. The cave scenery scrolls smoothly to the left as you progress.

The cave system is divided into a number of sectors, each being further divided into subsectors. Your progress is marked by indicators at the top of the screen.

If you lose one of your lives by crashing into something solid or getting shot down, you continue from the particular sector and sub-sector where the disaster occurred.

Lose all of your lives, though, and you are right back at the beginning of the complex again.

Each sector gets progressively harder, with the caves ever more claustrophobic and twisty. Likewise the quantity, variety and perniciousness of the cave's defence systems grow with each passing sector.

The defence systems consist of two main elements. Firstly, there are obstacles which block your way but don't go out of their way to attack your ship.

These consist of such things as generators, scanners, antennae and mid-air barricades.

Secondly there are the actively aggressive components such as alien vessels, asteroids and different types of ground to air missiles – rockets, lasers and plasma cannonballs.

Particularly nasty are the Backbiter missiles which, as their name suggests, fly up at an angle towards the unprotected rear of your ship.

Your sole means of defence, apart from agility, is a forward-firing, repeater cannon which is used to blast any obstacles and attackers that are destructible – and not all are.

If you are skilled enough to reach them, there are city settlements and the aliens' power generators within the complex. Your mission is to destroy these generators.

The game allows up to four players and has six skill levels, Level 1 being tough and 6 plain suicidal, so fast and numerous are the attackers and hazards.

You may choose to have five or seven spaceships at your disposal.

One unusual feature is that the caves and their contents appear to be randomly generated during play, so the game is different each time you start up your spaceship.

The drawback is that there is no way you can map the cave layouts, thus making eventual victory that much more difficult.

Not an original game by any means, and I missed the ability to bomb as well as shoot that other versions have included. Even so, this is the best Skramble clone I've seen on any micro.

Presentation, graphics, sound effects and music are all good quality, and with its random generator and range of options, the game should prove to be durable.

The Tail Of Beta Lyrae is an exciting and challenging shoot-em-up that any fan of the genre would enjoy playing. A first-rate implementation of a classic arcade game.

**Bob Chappell**

| | |
|---|---|
| ***Sound*** | ***8*** |
| ***Graphics*** | ***8*** |
| ***Playability*** | ***7*** |
| ***Value for money*** | ***8*** |
| ***Overall*** | ***8*** |

# A seat on the managers' bench

*Program: Football Manager*
*Price: £9.95*
*Supplier: Addictive Games, 10 Albert Road, Bournemouth BH1 1BZ. Tel: 0202 296404*

As you have guessed, your role here is to manage a club of your choice. The job ahead is to take your club from the Fourth Division to the First, and possibly win the FA Cup on the way.

This is by no means easy because players get injured, you lose a few too many matches and your gate receipts go down forcing you to take out a loan – with all the hazards of borrowing from the bank.

The first thing you do is select one of the current British Football Association league sides. Next you select a skill level, ranging from beginner to genius. All choices are made via the keyboard, so be prepared for lots of typing.

Then on to the main screen where you sell or list your players, arrange a loan, or perhaps pay one back. Loans can range from £250,000 for a Fourth Division team to £1,000,000 if you make it to the top.

Before every match you select your team. A careful evaluation of a player's morale, energy and skill will be needed if you want to succeed.

After every match you are given your share of the gate receipts and shown the results of the other games played in your division, thus allowing a league table to be calculated.

Fourteen matches later you are marked for your end of season league placement. If you are promoted you can look forward to the start of a new season.

Football Manager is a fun game with only three faults. It is written in Basic, so play is rather slow, there are no graphics, and it is only available on cassette. This is a shame as so many Atari owners have disc drives now. Software houses should take note.

On the positive side, there is a save game feature which means that you don't have to start from scratch every time you load.

Football Manager is a good game in which you can really get involved.

**Paul Irvine**

| | |
|---|---|
| ***Sound*** | ***N/A*** |
| ***Graphics*** | ***N/A*** |
| ***Playability*** | ***7*** |
| ***Value for money*** | ***5*** |
| ***Overall*** | ***6*** |

# Cavern capers



*Program: Sidewinder*
*Price: £9.95 (cassette), £14.95 (disc)*
*Supplier: Futureware, 143 Grays Inn Road, London WC1X 8UB. Tel: 01-359 7217.*

SIDEWINDER is a well written arcade game where you have to pilot a helicopter through underground enemy installations in search of kidnapped colleagues.

As my helicopter appeared on the take-off pad the screen filled with laser beams, gravity bombs and various large buildings and caverns.

I took off and the screen scrolled from right to left, revealing even more traps and joystick-breaking twists and turns.

Reaching the other end of the cavern after what seemed a nerve-shattering eternity I landed on the pad. Suddenly this raised to an upper take-off point and I had to fly back to the starting pad while avoiding new hazards.

Eventually I completed the first level, and progressed to a more difficult cavern with stronger defences.

You can replenish your ever-diminishing fuel supply by bombing fuel pods.

There are five caverns, and the fuel pods become harder and harder to hit. If you manage to complete the fifth cave there is quite a surprise in store, but I will leave that for you to discover for yourselves.

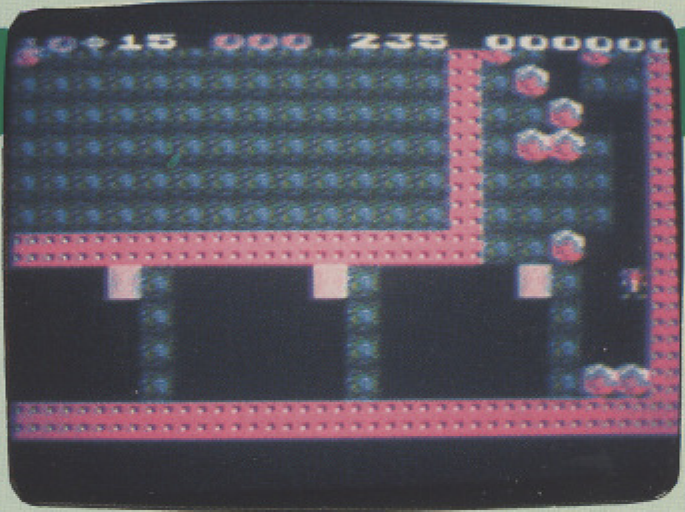
Sidewinder is great fun to play because it holds your attention, something that is missing from a lot of software nowadays. I found it very addictive, playing game after game to get on to the next cavern.

The program also offers a screen editor which allows you to design your own caverns, saving them to disc or tape.

**Paul Irvine**

| | |
|---|---|
| *Sound* | *7* |
| *Graphics* | *10* |
| *Playability* | *10* |
| *Value for money* | *10* |
| *Overall* | *10* |

# Danger, addictive



*Program: Boulderdash II*
*Price: £9.95 (cassette), £14.94 (disc)*
*Supplier: Databyte, Suite 31A, Grove Terrace, Highgate Road, London NW5 1PL. Tel: 01-482 1755.*

IF you've a taste for games that leave you red-eyed and stiff-fingered, that have you saying for the 99th consecutive time, "I'll just have one more go", that exert such an inexorable grip that you lose track of time, then Boulderdash II is just your cup of insomnia.

Its predecessor, Boulderdash, was one of the most enjoyable, addictive games ever released, a computer classic no less. This follow-up, although it is pretty much the same mixture as before, is every bit as riveting.

You control a cute little figure called Rockford who blinks and taps his foot impatiently if you leave him idle. Rockford's task is to tunnel his way through a series of two-dimensional caves and collect as many jewels as he can.

Now while the plot may strike you as perhaps lacking in the originality department and although the graphics, while pleasant, are nothing to gasp about, the game has one ingredient that sets the whole thing alight and starts the old adrenalin coursing. In a word, boulders.

Large boulders, embedded in various parts of the strata, are scattered liberally throughout the cave system. What makes the game so much fun is that the boulders are prone to come crashing down with a noise like thunder.

If Rockford's in the path of a falling boulder, and doesn't shift smartly out of the way, he gets squished and loses one of his three lives.

The boulders drop predictably. They will either fall straight down if unsupported or topple off underlying objects if there's nothing else to hold them in place.

You'll soon master the laws of physics in Boulderdash but there still remains the need to adopt a careful strategy if you're to succeed.

As well as the boulders, roving butterflies, amoeba, fireflies and other obstacles and oddities see to it that you're kept on your toes.

You control Rockford's movements with normal joystick manipulation. He leaves a tunnel behind him as he goes, and automatically collects any jewels he passes over.

When a certain number of jewels have been gathered, a secret exit appears, giving Rockford the chance to move on to the next cave.

There are 16 new caves to traverse, each of which consists of several scrolling screens and has its own unique layout and set of problems.

To increase the playing life of the game, each cave has five selectable difficulty levels; the greater the difficulty level, the more jewels you have to collect and the less time you have to do it in.

In addition, there are four non-obligatory intermissions to solve, giving you the chance to earn valuable bonus points.

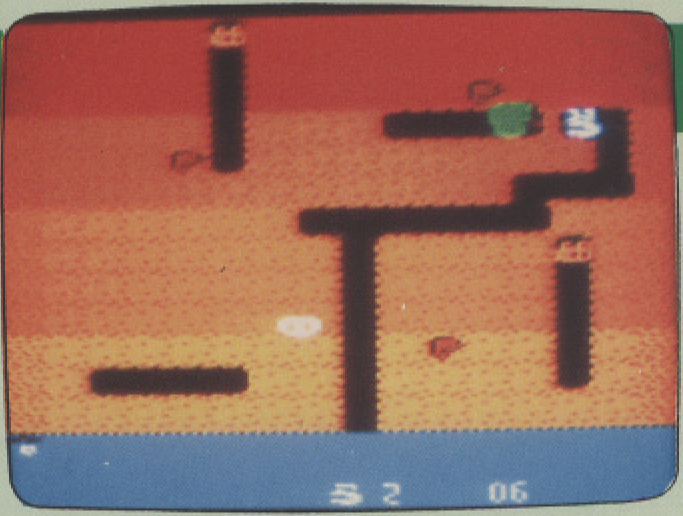
The program also thoughtfully provides the option of starting at caves A, E, I or M so you can get to see a lot of the game from the word go.

The Rockford exploits are classic – great fun and numbingly addictive. Become enslaved – go buy Boulderdash II.

**Bob Chappell**

| | |
|---|---|
| *Sound* | *8* |
| *Graphics* | *8* |
| *Playability* | *10* |
| *Value for money* | *9* |
| *Overall* | *10* |

# Wearing well...



*Program: Arcade Classics*
*Price: £9.95 (cassette), £14.95 (disc)*
*Supplier: US Gold, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020.*

GAMES compendiums seem to be all the rage at the moment. Arcade Classics is a collection of four fairly ancient Atari games bundled together on a single cassette or disc – Pole Position, Pac-Man, Mr Do! and Dig-Dug.

At least three were originally released on ROM cartridges (whatever happened to cartridges?) so this cobwebbed collection exudes a strong whiff of nostalgia. Nothing wrong with that, especially if the games are still fun to play.

Pole Position is still one of the best motor racing games around and is a must for any Atari owner. The game gives you the chance to drive a racing car at hair-raising speed around any of three different race tracks, competing against other computer-controlled cars.

To enter a race proper, you first have to complete a qualifying race within a time limit. How fast you qualify governs your position on the starting grid in the subsequent race.

Options include selecting the course and number of laps, and having a practice race without other cars getting in your way.

Beware that part of the inlay instructions which tell you how to control the car – it's wrong. For the record, the car accelerates automatically. Joystick forward switches you into high gear, backward into low while left and right move the car in that direction. To brake, press the fire button.

An exhilarating game – fast movement, good use of sound and graphics and still one of my personal favourites.

Pac-Man must surely be familiar to everyone. You control the famous yellow, jaw-snapping head and zoom around a simple maze, gobbling up dots while dodging pursuing ghosts.

Special energy dots which allow you to turn the tables on the ghosts and the inclusion of several difficulty levels add to the fun.

A simple game by current standards, yet still powerfully addictive. One of the few arcade conversions worthy of the title classic.

Mr Do!, with a 15 minute load time from cassette, consistently refused to boot up successfully. Let's hope that it was just my review copy at fault otherwise there could be a lot of frustrated buyers.

From memory, the game itself could almost be described as a loose combination of Pac-Man and Boulderdash. You tunnel around a field digging for cherries, cakes, puddings, burgers and so on while avoiding giant falling apples and fending off monsters with your Powerball.

It will not have escaped your notice that when it comes to computer game plots, reality and logic invariably take a back seat.

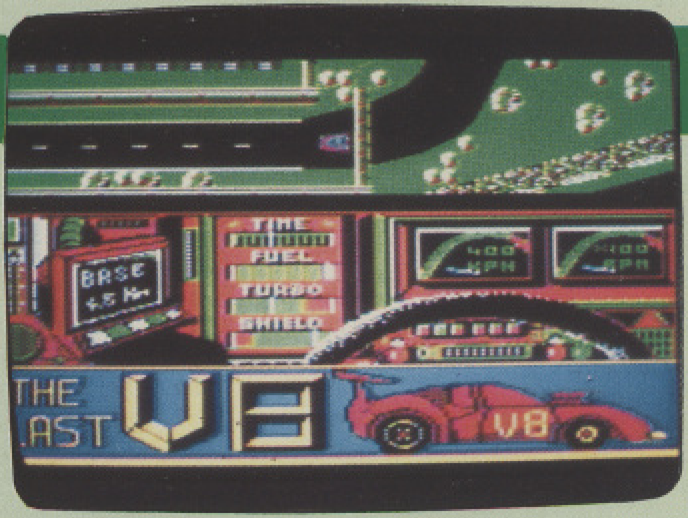
Dig-Dug was fairly popular in its time but this conversion of a golden oldie fails to sparkle. It is similar to, but nowhere near as good as, Mr Do! It is graphically crude, lacks variety of challenge and, worst of all, plays slowly.

Dig-Dug compares badly with today's standard of releases. The rest hold up pretty well, though.

**Bob Chappell**

| | |
|---|---|
| *Sound* | 6 |
| *Graphics* | 7 |
| *Playability* | 8 |
| *Value for money* | 9 |
| *Overall* | 8 |

# Desperate drive




*Program: The Last V8*
*Price: £2.95*
*Supplier: Mastertronic MAD Range, 8-10 Paul Street, London EC2A 4JH. Tel: 01-377 6880*

THE Last V8 is one of the first budget games to appear for the Atari computers and is a very interesting release too.

During the Nuclear War you have stayed hidden in your base developing a super car – the V8. Now, in a desperate attempt to reach the remainder of mankind, you come out into the open only to discover that there is an unexploded nuclear bomb with only minutes left before it detonates.

So you must drive to your base in the short time remaining – but will you make it?

If you think Elektraglide is difficult, you will find this game even more so. It isn't so much that you have a very short time in which to return to base, but more a matter of controlling the V8.

Instead of a straightforward up, down, left and right to control the car you have left, right, accelerate and decelerate.

It is very easy to skid off the road at any speed, let alone the speeds that you have to travel at in order to reach the base in time.

To add to your troubles you have a limited amount of fuel and your radiation shield gets progressively weaker.

On the positive side, the graphics are excellent and the scrolling is very smooth.

The screen is divided into two: the top half shows a bird's-eye view of your car as it travels along the road, and the bottom half shows your dashboard.

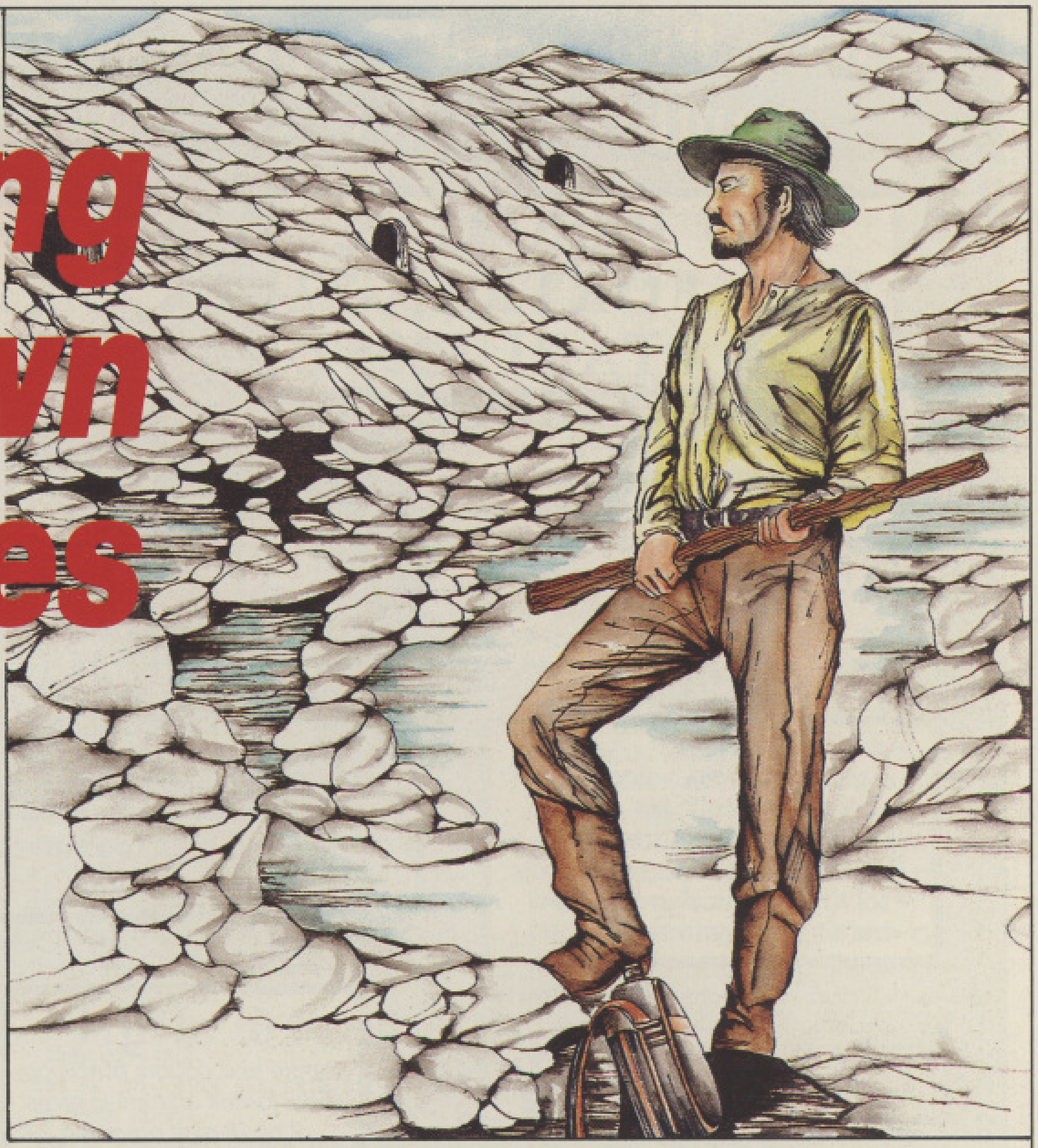
An ever-present onboard computer tells you how far it is to the base and how much time remains before the bomb goes off.

The Last V8 is a good game which lets itself down because it is extremely difficult to play. But at the asking price it is certainly a worthwhile challenge.

**Ben Halligan**

| | |
|---|---|
| *Sound* | 8 |
| *Graphics* | 9 |
| *Playability* | 4 |
| *Value for money* | 8 |
| *Overall* | 7 |

# Making your own mazes



**THIS program was written for those of you who liked my Cavern Escape in last month's *Atari User.* The problem with that game is that as soon as you have explored the maze of rooms, drawn a map and completed the game much of the enjoyment has been removed.**

With Maze Creator you can now make a new maze using the same elements as in the original game. Conversely if the game is too difficult you can make the game easier to complete.

Firstly I will explain how the maze is made up. There are four basic room layouts built into the program. These are arranged in a 10 by 10 square with variable connections between them. They are numbered from 0 to 99 starting in the top left corner running in horizontal rows.

The start is always 0 and the end is always at 99. These cannot be altered easily. The data for the exits of the rooms, the type of room, its name and the difficulty factor are all stored in data statements in lines 2000 to 2099. The key and lock rooms are defined in lines 1180 to 1189.

The maze creator program will allow easy design of a new maze and automatically create a file which will merge and replace these lines in Cavern Escape.

The program is easily used and largely self-explanatory. After it is run the screen will blank for a few seconds to read in a new character set. It will then create the current maze on the screen. The key rooms are in blue and the lock rooms are in red.

All the connections between the rooms are shown. The program will then ask if you are happy with the lock and key rooms as they are. Enter Y if you are or N if you want different rooms.

**MIKE ROWE tells how to enhance Cavern Escape**

If you want to alter these rooms you will be asked for a new location for each key and lock in turn. You must enter the number corresponding with new room from 1 to 98 – do not use 99 as this is the end.

After all the locks and keys are placed a flashing cursor will appear on the map. Use joystick 1 to move this to the first square to be edited and press the button. The room type will then be displayed in the text area of the screen.

You can cycle through the four types available using the joystick. When you have the type you require displayed press the button to store it. Next the difficulty level is displayed. Again alter this with the joystick and press the button.

Only rooms 3 and 4 are affected and the higher the number the greater the difficulty. After this the room being edited is placed to the right of the map with the exits displayed. Cycle through the various combinations of exits until the desired one is found using the joystick and then press the button.

After this you are asked to type in the room title. If you just press return the standard name for that type of room will be used. This will then bring back the flashing cursor and you are ready to edit the next square. If you have finished editing just press Start. This brings up a prompt for a filename to send the data to.

If you are using a cassette enter C:, if disc type D:filename, for example MAZE.LST. This will produce a listed file of the necessary lines of data to alter the original program.

When this is completed load in the

original Cavern Escape program, type ENTER "C:" or ENTER "D:MAZE.LST" and merge in the new data lines. Save out the new program under a different filename, and VIOLA a new game.

The program is essentially aimed at hackers at heart. As such it is not the most elegant piece of programming. There is a lot of error trapping built in, but it is very easy to make an impossible maze or even a version which will not run at all. A few golden rules will help prevent this:

- Lock and key rooms should not be placed on the same square under any circumstances.
- Lock rooms always need an East exit and therefore cannot be placed on the right column of rooms on the map.
- The program will usually stop you from making an exit which leads off the map as this is obviously impossible.
- Remember to place corresponding exits and entrances in neighbouring rooms so if a room has an East exit the room to the right of it must have a West exit. If not you will end up with a one-way door allowing movement in one direction only. This is used in the original maze to create five dead-end rooms.
- A subway room needs exits in all four directions and this is automatically done. However this means you cannot have one of these at the edge of the map.

I hope this utility helps you get more enjoyment from Cavern Escape. Happy creating.

```
10 REM  MAZE CONSTRUCTION SET
        FOR CAVERN ESCAPE
        MIKE ROWE 1986
100 GOSUB 5000
110 GOSUB 6000
120 GOSUB 200
130 GOSUB 700
150 GOSUB 300
160 GOSUB 400
190 GOTO 150
199 REM  DRAW START MAZE
200 FOR I=0 TO 9:FOR J=0 TO 9
210 POSITION I,J
212 C=1:L=I+J*10
215 FOR Z=1 TO 5:IF LOCK(Z)=L THEN C=3
3
217 IF KEY(Z)=L THEN C=129
218 NEXT Z
220 ? #6;CHR$(ROOM(L)+C);
230 NEXT J:NEXT I
290 RETURN
299 REM  JOYSTICK SELECTION
300 LOCATE X,Y,Z
310 POSITION X,Y:? #6;" ";:A=1^1
320 POSITION X,Y:? #6;CHR$(Z);
330 S=STICK(0)
340 IF S=6 OR S=5 OR S=7 THEN X=X+(X<9
)
341 IF S=9 OR S=10 OR S=11 THEN X=X-(X
>0)
342 IF S=6 OR S=10 OR S=14 THEN Y=Y-(Y
>0)
343 IF S=5 OR S=9 OR S=13 THEN Y=Y+(Y<
9)
344 IF Y=9 AND X=9 THEN Y=0:X=0
345 IF PEEK(53279)=6 THEN 900
350 IF STRIG(0)=1 THEN 300
360 GOSUB 850
370 IF STRIG(0)=0 THEN 370
390 RETURN
399 REM  ALTERATIONS
400 TYPE=TYPE(X+Y*10):? CHR$(125)
402 POSITION X,Y:? #6;" ";
410 POKE 656,1:? "ROOM TYPE IS NUMBER
";TYPE
412 IF TYPE=1 THEN ? " EMPTY ROOM "
413 IF TYPE=2 THEN ? " GUARDS     "
414 IF TYPE=3 THEN ? " SUBWAY     "
415 IF TYPE=4 THEN ? " SULPHUR PIT"
417 S=STICK(0)
420 IF S=13 THEN TYPE=TYPE-1:IF TYPE=0
 THEN TYPE=4
430 IF S=14 THEN TYPE=TYPE+1:IF TYPE=5
 THEN TYPE=1
440 IF STRIG(0)=1 THEN 410
445 GOSUB 850
450 TYPE(X+Y*10)=TYPE:DIFF=DIFF(X+Y*10
):? CHR$(125)
455 IF STRIG(0)=0 THEN 455
460 POKE 656,1:? "ROOM DIFFICULTY IS
";DIFF;"   "
465 S=STICK(0)
470 IF S=13 THEN DIFF=DIFF-1:IF DIFF=0
 THEN DIFF=255
480 IF S=14 THEN DIFF=DIFF+1:IF DIFF=2
56 THEN DIFF=1
490 IF STRIG(0)=1 THEN 460
492 GOSUB 850
495 IF STRIG(0)=0 THEN 495
500 DIFF(X+Y*10)=DIFF
510 IF TYPE=3 THEN ? "SUBWAY - ALL 4 D
IRECTIONS":ROOM=15:POSITION 15,2:? #6;
CHR$(ROOM+1):GOTO 600
520 ROOM=Z-1
525 ? CHR$(125):? "CHOOSE EXITS"
530 S=STICK(0):IF S=13 THEN ROOM=ROOM+
1:IF ROOM=16 THEN ROOM=0
540 IF S=14 THEN ROOM=ROOM-1:IF ROOM=-
1 THEN ROOM=15
550 POSITION 15,2:? #6;CHR$(ROOM+1)
555 A=1^1^1
560 IF STRIG(0)=1 THEN 530
570 GOSUB 850
580 IF STRIG(0)=0 THEN 580
590 POSITION 15,2:? #6;" ";
600 R=X+Y*10
605 RM=ROOM:IF ROOM>127 THEN ROOM=ROOM
-128
606 IF ROOM>31 THEN ROOM=ROOM-32
610 IF ROOM>7 AND R-INT(R/10)*10=9 THE
N ? "YOU CAN'T HAVE AN EAST EXIT HERE"
:GOTO 880
620 IF ROOM-8*(ROOM>7)>3 AND R/10=INT(
R/10) THEN ? "YOU CAN'T HAVE A WEST EX
IT HERE":GOTO 880
630 IF ROOM/2<>INT(ROOM/2) AND R<10 TH
EN ? "YOU CAN'T HAVE A NORTH EXIT HERE
":GOTO 880
640 IF (ROOM=2 OR ROOM=3 OR ROOM=6 OR
ROOM=7) AND R>89 THEN ? "YOU CAN'T HAV
E A SOUTH EXIT HERE":GOTO 880
645 IF (ROOM=10 OR ROOM=11 OR ROOM=14
OR ROOM=15) AND R>89 THEN ? "YOU CAN'T
 HAVE A SOUTH EXIT HERE":GOTO 880
647 ROOM=RM
650 RESTORE 6500+ROOM:ROOM(R)=ROOM
660 POSITION X,Y:? #6;CHR$(ROOM+1)
670 ? CHR$(125)
680 ? "ENTER ROOM TITLE (RETURN FOR NO
 TITLE)":INPUT L$:IF L$="" THEN L$=" "
685 L$(LEN(L$),20)="
  ":REM 20 SPACES
687 GOSUB 850:? CHR$(125)
690 RETURN
699 REM  NEW LOCK & KEYS
700 ? "ARE YOU HAPPY WITH THESE?"
710 INPUT F$:IF F$(1,1)="Y" THEN ? CHR
$(125):RETURN
720 FOR I=1 TO 5
722 A=KEY(I)
725 GOSUB 790:LOCATE X,Y,Z:POSITION X,
Y:? #6;CHR$(Z-128);
730 ? "KEY ";I;" AT ";KEY(I):? "NEW PO
SITION PLEASE";:INPUT A
735 GOSUB 790:LOCATE X,Y,Z:POSITION X,
Y:? #6;CHR$(Z+128);
740 A=LOCK(I)
745 GOSUB 790:LOCATE X,Y,Z:POSITION X,
Y:? #6;CHR$(Z-32);
750 ? "LOCK ";I;" AT ";LOCK(I):? "NEW
POSITION PLEASE";:INPUT A
755 GOSUB 790:LOCATE X,Y,Z:POSITION X,
Y:? #6;CHR$(Z+32);
770 NEXT I
775 ? CHR$(125):? " IMPORTANT ":? "LOC
K (RED) ROOMS MUST HAVE EAST EXIT"
780 RETURN
790 Y=INT(A/10):X=A-Y*10:RETURN
799 REM  MISCELLANEOUS SUBROUTINES
800 REM  SOUND1
810 SOUND 0,100,2,8
820 FOR I=1 TO 200:NEXT I
830 SOUND 0,0,0,0:RETURN
840 REM  SOUND2
850 FOR I=15 TO 1 STEP -0.5
```

```
860 SOUND 0,50,10,I
870 NEXT I:SOUND 0,0,0,0:RETURN
880 REM  BOUNDS ERROR
890 GOSUB 800:GOTO 400
899 REM  LIST NEW DATA LINES
900 ? CHR$(125)
910 ? "ENTER FILE TO WRITE TO.":? "E.G
. D:MAZE.LST OR C: ";
912 INPUT F$
915 CLOSE #1:OPEN #1,8,0,F$
920 FOR I=0 TO 99
923 J=ROOM(I)
925 IF ROOM(I)>127 THEN J=ROOM(I)-128:
GOTO 930
927 IF ROOM(I)>31 THEN J=ROOM(I)-32
930 RESTORE 6500+J:READ EXIT$
935 L$=LABEL$(I*20+1,I*20+20):IF L$(1,
1)=" " THEN L$=" "
940 ? #1;2000+I;" DATA ";EXIT$;",";TYP
E(I);",";L$;",";DIFF(I)
950 NEXT I
960 ? #1;1180;" IF R=";KEY(1);" THEN K
EY=1"
961 ? #1;1181;" IF R=";KEY(2);" THEN K
EY=2"
962 ? #1;1182;" IF R=";KEY(3);" THEN K
EY=3"
963 ? #1;1183;" IF R=";KEY(4);" THEN K
EY=4"
964 ? #1;1184;" IF R=";KEY(5);" THEN K
EY=5"
965 ? #1;1185;" IF R=";LOCK(1);" THEN
LOCK=1"
966 ? #1;1186;" IF R=";LOCK(2);" THEN
LOCK=2"
967 ? #1;1187;" IF R=";LOCK(3);" THEN
LOCK=3"
968 ? #1;1188;" IF R=";LOCK(4);" THEN
LOCK=4"
969 ? #1;1189;" IF R=";LOCK(5);" THEN
LOCK=5"
970 CLOSE #1
990 GRAPHICS 0:? "DONE!":END
2000 DATA XSXE,1,START,5
2001 DATA XXWE,4, ,5
2002 DATA XSWX,1, ,5
2003 DATA XSXX,4, ,100
2004 DATA XSXE,1, ,5
2005 DATA XXWE,2, ,5
2006 DATA XXWE,2, ,5
2007 DATA XSWX,1, ,5
2008 DATA XSXE,4, ,50
2009 DATA XXWX,1,KEY NUMBER 5,5
2010 DATA NSXX,1, ,5
2011 DATA XXXE,4, ,100
2012 DATA NSWE,3, ,10
2013 DATA NXWE,1, ,5
2014 DATA NSWE,3, ,10
2015 DATA XXWE,2, ,5
2016 DATA XXWX,4, ,100
2017 DATA NSXX,1, ,5
2018 DATA NXXE,1, ,5
2019 DATA XSWX,2, ,5
2020 DATA NSXX,2, ,5
2021 DATA XXXX,2,DEAD END!,5
2022 DATA NXXE,1,LOCKED DOOR 1,5
2023 DATA XXWX,1,KEY NUMBER 2,5
2024 DATA NXXE,2, ,5
2025 DATA XXWE,2, ,5
2026 DATA XXXX,2,DEAD END!,5
2027 DATA NSXE,2, ,5
2028 DATA XXWX,4, ,100
2029 DATA NSXX,2, ,5
2030 DATA NSXE,2, ,5
2031 DATA NSWE,3, ,5
2032 DATA XSWX,1, ,5
2033 DATA XXXX,2,DEAD END!,5
2034 DATA XSWX,2, ,5
2035 DATA XSXE,2, ,5
2036 DATA XSWE,4, ,50
2037 DATA NSWX,1, ,5
2038 DATA XSXE,1,LOCKED DOOR 3,5
2039 DATA NXWX,4, ,120
2040 DATA NXXX,2, ,5
2041 DATA NSXX,1, ,5
2042 DATA NXXE,1, ,5
2043 DATA XSWX,1, ,5
2044 DATA NSXX,4, ,30
2045 DATA NSXX,2, ,5
2046 DATA NSXX,2, ,5
2047 DATA NXXE,4, ,50
2048 DATA NSWE,3, ,20
2049 DATA XSWX,2, ,5
2050 DATA XSXE,1, ,5
2051 DATA NSWE,3, ,5
2052 DATA XXWE,2, ,5
2053 DATA NSWE,3, ,10
2054 DATA NSWX,1, ,5
2055 DATA NXXE,1, ,5
2056 DATA NSWE,3, ,30
2057 DATA XSWX,2, ,5
2058 DATA NXXE,2, ,5
2059 DATA NXWX,2, ,5
2060 DATA NSXX,1, ,5
2061 DATA NXXE,1, ,5
2062 DATA XSWE,2, ,5
2063 DATA NXWX,1, ,5
2064 DATA NSXX,2, ,5
2065 DATA XSXX,4, ,200
2066 DATA NXXX,4, ,200
```

## Get it right!

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 10 | 42438 | 100 | 1937 | 110 | 1940 |
| 120 | 1880 | 130 | 1895 | 150 | 1883 |
| 160 | 1886 | 190 | 1623 | 199 | 10466 |
| 200 | 4517 | 210 | 2448 | 212 | 2078 |
| 215 | 6528 | 217 | 4042 | 218 | 1379 |
| 220 | 3704 | 230 | 2822 | 290 | 1498 |
| 299 | 12629 | 300 | 2351 | 310 | 5196 |
| 320 | 5003 | 330 | 2006 | 340 | 6698 |
| 341 | 6843 | 342 | 6858 | 343 | 6680 |
| 344 | 5118 | 345 | 4320 | 350 | 3749 |
| 360 | 1918 | 370 | 3759 | 390 | 1498 |
| 399 | 8041 | 400 | 5614 | 402 | 4002 |
| 410 | 7549 | 412 | 5991 | 413 | 5253 |
| 414 | 5284 | 415 | 5871 | 417 | 2006 |
| 420 | 9065 | 430 | 9079 | 440 | 3752 |
| 445 | 1918 | 450 | 8653 | 455 | 3771 |
| 460 | 8112 | 465 | 2006 | 470 | 8978 |
| 480 | 8852 | 490 | 3762 | 492 | 1918 |
| 495 | 3779 | 500 | 3203 | 510 | 17831 |
| 520 | 1706 | 525 | 5077 | 530 | 11009 |
| 540 | 9336 | 550 | 5517 | 555 | 1395 |
| 560 | 3757 | 570 | 1918 | 580 | 3763 |
| 590 | 4021 | 600 | 1458 | 605 | 7956 |
| 606 | 5670 | 610 | 14652 | 620 | 17094 |
| 630 | 15469 | 640 | 18799 | 645 | 20168 |
| 647 | 1590 | 650 | 6223 | 660 | 5730 |
| 670 | 1737 | 680 | 13459 | 685 | 7157 |
| 687 | 3681 | 690 | 1498 | 699 | 10008 |
| 700 | 5758 | 710 | 8452 | 720 | 2089 |
| 722 | 1542 | 725 | 10108 | 730 | 10464 |
| 735 | 10100 | 740 | 1878 | 745 | 9906 |
| 750 | 10766 | 755 | 9898 | 770 | 1345 |
| 775 | 16747 | 780 | 1498 | 790 | 5380 |
| 799 | 16450 | 800 | 4986 | 810 | 2614 |
| 820 | 3883 | 830 | 3975 | 840 | 4988 |
| 850 | 3734 | 860 | 2650 | 870 | 5460 |
| 880 | 8752 | 890 | 3538 | 899 | 12786 |
| 900 | 1737 | 910 | 10031 | 912 | 1659 |
| 915 | 3966 | 920 | 2326 | 923 | 1936 |
| 925 | 7791 | 927 | 5569 | 930 | 5049 |
| 935 | 8158 | 940 | 9453 | 950 | 1345 |
| 960 | 6519 | 961 | 6533 | 962 | 6547 |
| 963 | 6561 | 964 | 6575 | 965 | 6710 |
| 966 | 6717 | 967 | 6724 | 968 | 6731 |
| 969 | 6738 | 970 | 1559 | 990 | 4584 |
| 2000 | 4126 | 2001 | 2870 | 2002 | 2944 |
| 2003 | 3190 | 2004 | 2853 | 2005 | 2866 |
| 2006 | 2866 | 2007 | 2944 | 2008 | 2955 |

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 2009 | 5308 | 2010 | 2928 | 2011 | 3110 |
| 2012 | 2925 | 2013 | 2844 | 2014 | 2925 |
| 2015 | 2866 | 2016 | 3201 | 2017 | 2928 |
| 2018 | 2848 | 2019 | 2946 | 2020 | 2930 |
| 2021 | 4622 | 2022 | 5249 | 2023 | 5293 |
| 2024 | 2850 | 2025 | 2866 | 2026 | 4622 |
| 2027 | 2835 | 2028 | 3201 | 2029 | 2930 |
| 2030 | 2835 | 2031 | 2833 | 2032 | 2944 |
| 2033 | 4622 | 2034 | 2946 | 2035 | 2855 |
| 2036 | 2951 | 2037 | 2924 | 2038 | 5256 |
| 2039 | 3185 | 2040 | 2945 | 2041 | 2928 |
| 2042 | 2848 | 2043 | 2944 | 2044 | 3028 |
| 2045 | 2930 | 2046 | 2930 | 2047 | 2950 |
| 2048 | 2926 | 2049 | 2946 | 2050 | 2853 |
| 2051 | 2833 | 2052 | 2866 | 2053 | 2926 |
| 2054 | 2924 | 2055 | 2848 | 2056 | 2927 |
| 2057 | 2946 | 2058 | 2850 | 2059 | 2941 |
| 2060 | 2928 | 2061 | 2848 | 2062 | 2851 |
| 2063 | 2939 | 2064 | 2930 | 2065 | 3191 |
| 2066 | 3186 | 2067 | 5252 | 2068 | 2851 |
| 2069 | 4622 | 2070 | 2848 | 2071 | 2946 |
| 2072 | 3027 | 2073 | 3111 | 2074 | 2926 |
| 2075 | 2835 | 2076 | 3116 | 2077 | 2866 |
| 2078 | 2929 | 2079 | 2965 | 2080 | 2853 |
| 2081 | 2939 | 2082 | 5250 | 2083 | 2946 |
| 2084 | 3031 | 2085 | 5238 | 2086 | 2946 |
| 2087 | 3111 | 2088 | 2844 | 2089 | 3202 |
| 2090 | 5272 | 2091 | 5207 | 2092 | 2963 |
| 2093 | 2939 | 2094 | 5207 | 2095 | 4622 |
| 2096 | 2850 | 2097 | 2866 | 2098 | 2866 |
| 2099 | 4289 | 4999 | 7525 | 5000 | 12964 |
| 5010 | 7178 | 5100 | 11462 | 5110 | 3246 |
| 5120 | 8293 | 5130 | 8521 | 5140 | 9791 |
| 5500 | 2271 | 5510 | 6830 | 5515 | 1291 |
| 5520 | 6273 | 5530 | 6292 | 5540 | 6314 |
| 5550 | 6302 | 5560 | 7942 | 5570 | 4092 |
| 5580 | 1345 | 5900 | 1498 | 5999 | 9721 |
| 6000 | 4910 | 6010 | 11205 | 6020 | 7072 |
| 6030 | 2286 | 6040 | 3976 | 6050 | 4011 |
| 6060 | 8190 | 6070 | 1345 | 6100 | 4809 |
| 6110 | 2185 | 6120 | 7775 | 6130 | 7810 |
| 6150 | 1084 | 6160 | 5533 | 6170 | 5233 |
| 6180 | 8139 | 6190 | 1345 | 6500 | 2288 |
| 6501 | 2260 | 6502 | 2273 | 6503 | 2253 |
| 6504 | 2284 | 6505 | 2264 | 6506 | 2269 |
| 6507 | 2249 | 6508 | 2193 | 6509 | 2173 |
| 6510 | 2178 | 6511 | 2158 | 6512 | 2189 |
| 6513 | 2169 | 6514 | 2174 | 6515 | 2154 |
| 6900 | 1498 | | | | |



```
2067 DATA NXXE,1,LOCKED DOOR 4,5
2068 DATA XSWE,2, ,5
2069 DATA XXXX,2,DEAD END!,5
2070 DATA NXXE,1, ,5
2071 DATA XSWX,2, ,5
2072 DATA NSXX,4, ,20
2073 DATA XXXE,4, ,200
2074 DATA NSWX,2, ,5
2075 DATA NSXE,2, ,5
2076 DATA XXWE,4, ,150
2077 DATA XXWE,2, ,5
2078 DATA NSWE,3, ,50
2079 DATA XXWX,4, ,5
2080 DATA XSXE,1, ,5
2081 DATA NXWX,1, ,5
2082 DATA NXXE,1,LOCKED DOOR 2,5
2083 DATA XSWX,2, ,5
2084 DATA NSXX,4, ,60
2085 DATA NSXE,1,LOCKED DOOR 5,5
2086 DATA XSWX,2, ,5
2087 DATA XXXE,4, ,200
2088 DATA NXWE,1, ,5
2089 DATA XXWX,4, ,200
2090 DATA NXXX,1,KEY NUMBER 1,5
2091 DATA XXXE,1,KEY NUMBER 3,5
2092 DATA XXWE,4, ,20
2093 DATA NXWX,1, ,5
2094 DATA NXXX,1,KEY NUMBER 4,5
2095 DATA XXXX,2,DEAD END!,5
2096 DATA NXXE,2, ,5
2097 DATA XXWE,2, ,5
2098 DATA XXWE,2, ,5
2099 DATA XXXX,5,ESCAPE!,5
4999 REM  INITIALIZE 
5000 GRAPHICS 2:SETCOLOR 0,3,8:SETCOLO
R 1,0,10:SETCOLOR 3,8,8:POKE 752,1
5010 ? "BLUE=KEY ROOMS":? "RED=LOCK RO
OMS"
5100 DIM ROOM(100),TYPE(100),DIFF(100)
,LABEL$(100*20),EXIT$(4),L$(20),F$(13)
5110 DIM KEY(5),LOCK(5)
5120 LABEL$(1)=" ":LABEL$(100*20)=" ":
LABEL$(2)=LABEL$
5130 KEY(1)=90:KEY(2)=23:KEY(3)=91:KEY
(4)=94:KEY(5)=9
5140 LOCK(1)=22:LOCK(2)=82:LOCK(3)=38:
LOCK(4)=67:LOCK(5)=85
5500 RESTORE 2000
5510 FOR I=0 TO 99:READ EXIT$,TYPE,L$,
DIFF
5515 ROOM=0
5520 IF EXIT$(1,1)="N" THEN ROOM=ROOM+
1
5530 IF EXIT$(2,2)="S" THEN ROOM=ROOM+
2
5540 IF EXIT$(3,3)="W" THEN ROOM=ROOM+
4
5550 IF EXIT$(4,4)="E" THEN ROOM=ROOM+
8
5560 ROOM(I)=ROOM:TYPE(I)=TYPE:DIFF(I)
=DIFF
5570 LABEL$(I*20+1,I*20+20)=L$
5580 NEXT I
5900 RETURN
5999 REM  CHARACTER SET 
6000 CH=PEEK(106)-8:CHSET=CH*256
6010 FOR I=0 TO 511:POKE CHSET+I,PEEK(
57344+I):NEXT I:POKE 756,CH+2
6020 FOR I=0 TO 7:POKE CHSET+512+I,0:N
EXT I
6030 FOR I=0 TO 15
6040 POKE CHSET+520+I*8,255
6050 POKE CHSET+527+I*8,255
6060 FOR J=1 TO 6:POKE CHSET+520+I*8+J
,129:NEXT J
6070 NEXT I
6100 RESTORE 6500:FOR I=0 TO 15
6110 READ EXIT$
6120 IF EXIT$(1,1)="N" THEN POKE CHSET
+520+I*8,231
6130 IF EXIT$(2,2)="S" THEN POKE CHSET
+527+I*8,231
6150 EW=129
6160 IF EXIT$(3,3)="W" THEN EW=EW-128
6170 IF EXIT$(4,4)="E" THEN EW=EW-1
6180 POKE CHSET+523+I*8,EW:POKE CHSET+
524+I*8,EW
6190 NEXT I
6500 DATA XXXX
6501 DATA NXXX
6502 DATA XSXX
6503 DATA NSXX
6504 DATA XXWX
6505 DATA NXWX
6506 DATA XSWX
6507 DATA NSWX
6508 DATA XXXE
6509 DATA NXXE
6510 DATA XSXE
6511 DATA NSXE
6512 DATA XXWE
6513 DATA NXWE
6514 DATA XSWE
6515 DATA NSWE
6900 RETURN
```

# Player designer takes the tedium out of plotting all those pixels



## Part Two of STEPHEN WILLIAMSON's series on player missile graphics

**WE already know that a player is a shape formed by pixels plotted within a player stripe. The normal method of designing a player is to draw the shape on graph paper and work out the data that is used by the player missile system to define that shape.**

To do this requires a little knowledge of binary maths. Stripped down to its bare essentials, a computer is not very intelligent. Its heart is an area which recognises whether a switch is turned off or on. In the case of the Atari there are eight switches or gates through which a small electrical current can pass.

In the binary system, if a current is present this is represented by the number 1, and if there is no current 0 is used. Because the Atari works on an eight gate system it is called an 8 bit machine. Its big brother the Atari ST uses a 16 bit system which is more powerful.

When we design a player we have to work in a similar way. The width of the player stripe is eight pixels and within any row pixels can either be turned on (1) or turned off (0).

Figure I is a diagram of the bug encountered in last month's program. The shape occupies 11 rows within the player stripe. Each empty square in the diagram represents a section of the stripe where no pixel has been plotted, with the filled squares representing the plotted pixels that make up the bug shape. In each row of eight pixels there are various combinations of pixels that are either switched on or switched off. Figure I also shows the binary representation of the shape.

Although the Atari works at the binary level it will not directly accept binary input. In the early days of the first mainframe computers programmers wrote their programs in the binary system.

But it was soon evident that the human mind, unlike computers, finds writing programs as a series of 0s and 1s very tedious and the chances of making errors are high. Hence the need for computer languages – machine code, Pascal, Cobol, good old Basic and so on.

Having designed the player using a binary-type system we have to convert all those 0s and 1s into something that the Atari can understand. This is done by a process known as bit-mapping. In each row of the design, the combination of pixels that are off or on can be represented by a single number.

To do this each pixel space within a row is assigned a numerical value. Starting from the last column on the right the first position is assigned a value of 1, the next column to the left 2 (double 1), the next column 4 (double 2) and so on until the left hand column becomes 128 – Figure I should make this clear.

By adding up the values of all the plotted pixels in a row we arrive at a single number that represents the pattern of pixels, or the bit pattern.

If you look at the top row of the diagram, a pixel has been plotted in the 8 column and a pixel plotted in the 32 column. Adding these two together gives a value of 40 which is the numerical code that represents the pattern of pixels in this row.

Using the bit-map system any combination of eight pixels that are on or off can be given a single number value from 0 – which equals no pixels plotted – to 255 when all the pixels in a row have been plotted (255 = 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1).

255, which in binary maths is equivalent to current being present in all eight gates, is the maximum value that can be understood by the 8 bit system which is why if you poke a value above 255 into any address you will get an error message.

Of course in Basic we can use numbers larger than 255, but this is only because the Basic Interpreter breaks larger numbers up into two or more 8 bit numbers before passing them on to the processor.

The diagram shows how the bug shape is coded into a series of 11 bit-mapped numbers which can then be incorporated into data statements

in a Basic program to be read and poked into the area of memory where the appropriate player stripe data is held. We will look at how this area is allocated next month.

This bit-mapping process may seem a bit cumbersome. It is also difficult to visualise what the graph paper plotted shape will actually look like on the screen. Graph paper consists of squares whereas player missile pixels are actually rectangular, so there is a problem in working out the correct ratio of height to width.

But take heart, the computer is designed to take the strain out of such tasks. This month's program is a player designer that works out the correct bit-mapped numbers. The designer will allow you to design and edit player shapes in such a way that you will see exactly how the shape will look when used in your player missile programs.

The designer plots a grid of dots eight wide by 20 high which represents an enlarged section of a player stripe. A cursor can be moved around this grid using a joystick.

By pressing the fire button an asterisk will appear beneath the cursor and the equivalent pixel will be plotted on the player stripe which has been set up to the right of the grid. Placing the cursor over an asterisk and pressing the fire button will cause the asterisk to be erased and the equivalent pixel in the player stripe will be switched off.

At the bottom of the screen is a list of the various options that are available to the operator. Key C changes the colour and brightness of the player. The system used is the same as that found in the Atari Reference Guide with a 16 colour palette – 0 to 15 – and brightness range from 0 to 14.

Only even brightness numbers alter the brightness. If an odd number is entered than the brightness value one below this number will be used by the system. After entering a brightness or colour value, press Return.

When satisfied with your design pressing D gives a list of the bit-mapped numbers that represent the shape, and these can then be used in programs to create the same player shape again. If you are not satisfied with the design then E erases the shape and you can start again.

Key M moves the player around the screen using the joystick. The player missile system supports up to four players. The designer allows you to design more than one player. By placing a player next to another player a wider or taller shape can be designed.

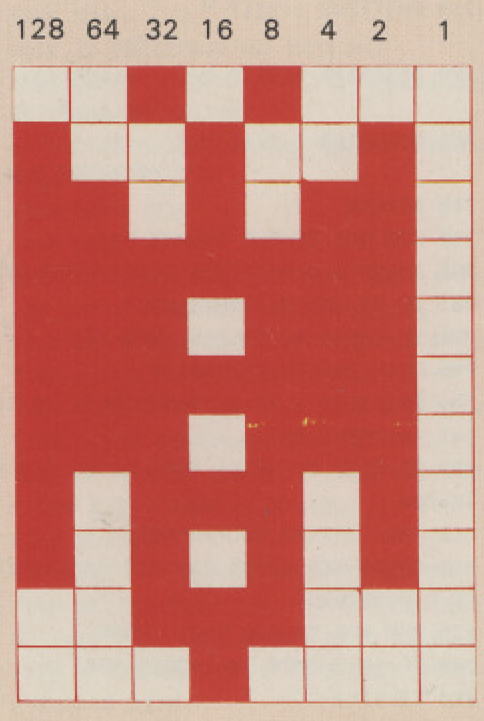
Although the designer only allows you to design a player up to a maximum of 20 pixels high this restriction can be overcome by placing one player directly above another. The program will work out the number codes for each shape separately but these can be easily combined in your own programs for taller shapes.

A two colour player can be designed by placing players over or near each other. In this way you could, for example, design a man with a pink head using one player and the rest of him a different colour using another. Multicoloured designs are possible by using all four players.

To further increase the option of multicoloured players pressing key O gives a third colour when two players overlap. This third colour is decided by the Atari. If, for example, you overlap a green player with a blue player the resultant third colour will be orange. Experiment with this option to see other colour combinations.

Another restriction of the overlap facility is that it only works with Player 0 overlapping with Player 1 and Player 2 with Player 3. You cannot get a third colour by overlapping Player 0 with Player 2, or Player 1 with Player 3 and so on. So remember to stick to the 0 and 1 or 2

→




| Binary | Bit-mapped number | |
|---|---|---|
| 0 0 1 0 1 0 0 0 | 32+8 | =40 |
| 1 0 0 1 0 0 1 0 | 128+16+2 | =146 |
| 1 1 0 1 0 1 1 0 | 128+64+16+4+2 | =214 |
| 1 1 1 1 1 1 1 0 | 128+64+32+16+8+4+2 | =254 |
| 1 1 1 0 1 1 1 0 | 128+64+32+8+4+2 | =238 |
| 1 1 1 1 1 1 1 0 | 128+64+32+16+8+4+2 | =254 |
| 1 1 1 0 1 1 1 0 | 128+64+32+8+4+2 | =238 |
| 1 0 1 1 1 0 1 0 | 128+32+16+8+2 | =186 |
| 1 0 1 0 1 0 1 0 | 128+32+8+2 | =170 |
| 0 0 1 1 1 0 0 0 | 32+16+8 | =56 |
| 0 0 0 1 0 0 0 0 | 16 | =16 |

*Figure I: Bit map of a player*

and 3 combination. Pressing Key O again switches off the overlap mode.

A player can be a single or double resolution player. All players must be in the same resolution, as due to a limitation within the player missile graphic system it is not possible to mix players of different resolutions. It may be possible to overcome this limitation with the clever use of interrupts – but this could only be done in machine code and is beyond the scope of this series.

Key S changes the size of the player on the horizontal plane. The player missile system has three size options – normal size, double size and quadruple size. Unlike the resolution option it is possible to mix players of different sizes. Press keys 0 to 3 to change the player which the designer is operating on.

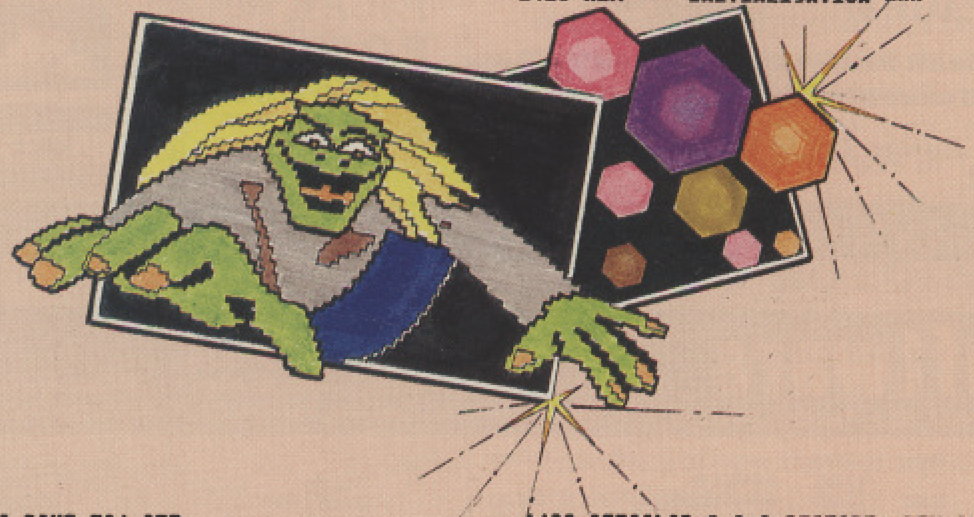
The program could also be used to design characters in programs where you want to redefine all or part of the Atari character set. This can be achieved by using eight rows of the grid only – which will not give an accurate depiction of the redefined character as character pixels are smaller than player pixels – but it does bit-map the character correctly and is a lot easier than working with squared paper.

I will not go into how the designer program is constructed as plenty of REM statements label each section of the program. At the end of the series when I have detailed all the processes needed to control the player missile system it may be useful to refer back to the program listing of the designer to see how the program options manipulate the player missile system – how the program changes resolution, size, plots pixels, moves players and so on.

● *Next month I will show you how to make the shape that you have designed appear on the screen from within a player missile program.*

```
10 REM  PLAYER DESIGNER
20 REM  by Stephen Williamson
30 REM  for Atari User
40 REM  PLAYER MISSILE GRAPHICS
50 REM  PART 2 - PROGRAM I
60 GOSUB 1420
70 REM *** MAIN LOOP ***
80 KEY=PEEK(764)
90 IF STRIG(0)=0 AND CH(X+ADD,Y)=46 TH
EN CH(X+ADD,Y)=42:POSITION X,Y:? "*←";
:GOSUB 270:GOTO 110
100 IF STRIG(0)=0 AND CH(X+ADD,Y)=42 T
HEN CH(X+ADD,Y)=46:POSITION X,Y:? ".←"
;:GOSUB 270
110 ST1=STICK(0):IF ST1<>15 THEN GOSUB
 1200
120 IF KEY=18 THEN POKE 764,255:GOSUB
760
130 IF KEY=62 THEN GOSUB 840:POKE 764,
255
140 IF KEY=58 THEN GOSUB 900:POKE 764,
255
150 IF KEY=37 THEN GOSUB 1100:POKE 764
,255
160 IF KEY=40 THEN GOSUB 1260
170 IF KEY=62 THEN GOSUB 840:POKE 764,
255
180 IF KEY=50 AND PM<>0 THEN PM=0:FLAG
=1:GOSUB 400
190 IF KEY=31 AND PM<>1 THEN PM=1:FLAG
=1:GOSUB 400
200 IF KEY=30 AND PM<>2 THEN PM=2:FLAG
=1:GOSUB 400
210 IF KEY=26 AND PM<>3 THEN PM=3:FLAG
=1:GOSUB 400
220 IF KEY=42 THEN FOR Y=1 TO 20:DAT(P
M,Y)=0:NEXT Y:FLAG=1:ERASE=1:GOSUB 400
:POKE 764,255:ERASE=0
230 IF KEY=8 AND PEEK(623)=0 THEN POKE
 623,32:KEY=0:POKE 764,255
240 IF KEY=8 AND PEEK(623)=32 THEN POK
E 623,0:KEY=0:POKE 764,255
250 GOTO 80
260 REM *** COMPILE DATA ***
270 DAT(PM,Y)=0
280 IF CH(1+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+128
290 IF CH(2+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+64
300 IF CH(3+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+32
310 IF CH(4+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+16
320 IF CH(5+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+8
330 IF CH(6+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+4
340 IF CH(7+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+2
350 IF CH(8+1+ADD,Y)=42 THEN DAT(PM,Y)
=DAT(PM,Y)+1
360 R=1:IF PEEK(559)=46 THEN R=2
370 POKE PMBASE+Q+Y+(YY(PM)/R),DAT(PM,
Y):POKE PMBASE+(21*PM)+Y,DAT(PM,Y)
380 RETURN
390 REM *** CHANGE PLAYER ***
400 POSITION 15,0:? "PLAYER NO.";PM
410 IF PEEK(559)=46 THEN 600
420 R=1
430 IF PM=0 THEN Q=1024:ADD=0
440 IF PM=1 THEN Q=1280:ADD=8
450 IF PM=2 THEN Q=1536:ADD=16
460 IF PM=3 THEN Q=1792:ADD=24
470 Q0=1024:Q1=1280:Q2=1536:Q3=1792
480 IF FLAG=0 THEN 530
490 IF ERASE=1 THEN FOR J=PMBASE+(21*P
M) TO PMBASE+(21*PM)+20:POKE J,0:NEXT
J
500 FOR X1=1 TO 8:FOR Y1=1 TO 20
510 IF ERASE=1 THEN CH(X1+1+ADD,Y1)=46
520 POSITION X1+1,Y1:? CHR$(CH(X1+1+AD
D,Y1)):NEXT Y1:NEXT X1:CH=0
530 FOR Y1=1 TO 20
540 POKE PMBASE+Q0+(YY(0)/R)+Y1,DAT(0,
Y1)
550 POKE PMBASE+Q1+(YY(1)/R)+Y1,DAT(1,
Y1)
560 POKE PMBASE+Q2+(YY(2)/R)+Y1,DAT(2,
Y1)
570 POKE PMBASE+Q3+(YY(3)/R)+Y1,DAT(3,
Y1)
580 NEXT Y1:X=2:Y=1:FLAG=0
590 POSITION X,Y:PRINT "↑":RETURN
600 IF PM=0 THEN Q=512:ADD=0
610 IF PM=1 THEN Q=640:ADD=8
620 IF PM=2 THEN Q=768:ADD=16
630 IF PM=3 THEN Q=896:ADD=24
640 R=2:Q0=512:Q1=640:Q2=768:Q3=896:GO
TO 480
650 REM ** PRINT VALID COMMANDS **
660 POSITION 1,22:? "COLOUR DATA ERASE
 MOVE OVERLAP RES."
670 POSITION 1,23:? "SIZE 0TO3CHANGE P
LAYER";
680 POSITION 15,0:? "PLAYER NO.";PM
690 POSITION X,Y:RETURN
700 REM *** ERASE BOTTOM 3 LINES ***
710 POSITION 1,21:? "
                           ";
720 POSITION 1,22:? "
                           ";
730 POSITION 1,23:? "
                          ";:POSITION X,Y
740 RETURN
750 REM *** CHANGE COLOUR ***
760 GOSUB 710:POSITION 1,21:? "COLOUR
NO. (0 TO 15) ";:INPUT COL
770 IF COL<0 OR COL>15 THEN 760
780 POKE 704+PM,COL*16+10
790 POSITION 1,22:? "BRIGHTNESS (0 TO
14) ";:INPUT BR
800 IF BR<0 OR BR>14 THEN GOSUB 710:GO
TO 790
810 POKE 704+PM,COL*16+BR
820 GOSUB 710:GOSUB 660:X=2:Y=1:POSITI
ON X,Y:RETURN
830 REM *** CHANGE SIZE   ***
840 IF SI=3 THEN SI=1:GOTO 860
850 SI=SI+1
860 POKE 53256+PM,SI
870 KEY=255:POKE 764,255
880 RETURN
```

```
890 REM *** DISPLAY DATA ***
900 POKE 764,255:GOSUB 710
910 POSITION 2,21
920 FOR J=1 TO 9
930 ? CHR$(J+176);DAT(PM,J);" ";
940 IF J=7 THEN ?
950 NEXT J
960 ? "10";DAT(PM,10);" ";
970 ? "11";DAT(PM,11);" ";
980 ? "12";DAT(PM,12);" ";
990 ? "13";DAT(PM,13);" ";
1000 ? "14";DAT(PM,14);" ";
1010 ? "15";DAT(PM,15);" ";
1020 ? "16";DAT(PM,16);" ";
1030 ? "17";DAT(PM,17);" ";
1040 ? "18";DAT(PM,18);" ";
1050 ? "19";DAT(PM,19);" ";
1060 ? "20";DAT(PM,20);
1070 IF PEEK(764)=255 THEN 1070
1080 GOSUB 710:GOSUB 660:X=2:Y=1:POSIT
ION X,Y:RETURN
1090 REM *** MOVE PLAYER ***
```



```
1100 POKE 764,255
1110 ST1=STICK(0)
1120 IF PEEK(764)<>255 THEN RETURN
1130 YY(PM)=YY(PM)+(ST1=13)-(ST1=14)
1140 R=1
1150 IF PEEK(559)=46 THEN R=2
1160 XX(PM)=XX(PM)+(ST1=7)-(ST1=11):PO
KE 53248+PM,XX(PM)
1170 D=USR(1590,PMBASE+(21*PM),PMBASE+
Q+(YY(PM)/R),22)
1180 GOTO 1110
1190 REM *** MOVE CURSOR ***
1200 IF ST1=7 AND X<9 THEN X=X+1:POSIT
ION X,Y:? CHR$(CH(X+ADD,Y));"+";
1210 IF ST1=11 AND X>2 THEN X=X-1:POSI
TION X,Y:? CHR$(CH(X+ADD,Y));"+";
1220 IF ST1=14 AND Y>1 THEN Y=Y-1:POSI
TION X,Y:? CHR$(CH(X+ADD,Y));"+";
1230 IF ST1=13 AND Y<20 THEN Y=Y+1:POS
ITION X,Y:? CHR$(CH(X+ADD,Y));"+";
1240 RETURN
1250 REM *** CHANGE RESOLUTION ***
1260 KK=255:POKE 764,255:IF PEEK(559)=
62 THEN POKE 559,46:R=1:GOTO 1290
1270 IF PEEK(559)=46 THEN POKE 559,62:
R=2:GOTO 1290
1280 RETURN
1290 A=USR(1536)
1300 GOSUB 400:RETURN
1310 REM *** DATA FOR ***
1320 REM *** M.C. ROUTINES ***
1330 DATA 104,201,3,208,81,104,133,225
,104,133,224,104,133,227,104,133,226,1
04,133,229
1340 DATA 104,133,228,169,0,133,230,13
3,231,160,177,224,145,226,24,169,1,101
1350 DATA 224,133,224,169,0,101,225,13
3,225,24,169,1,101,226,133,226,169,0,1
01,227,133,227,24
1360 DATA 169,1,101,230,133,230,169,0,
101,231,133,231,24,165,228,197,230,208
,206,165
1370 DATA 229,197,231,208,200,96
1380 DATA 169,0,162,0,157,128,121,232,
208,250,157,128,122,232,208,250,157,128
1390 DATA 123,232,208,250,157,128,124,
232,208,250,157,128,125,232,208,250,15
7,128
1400 DATA 126,232,208,250,157,128,127,
232,224,129,208,248,104,96
1410 REM *** INITIALISATION ***
1420 SETCOLOR 2,0,0:RESTORE :DIM CH(40
,20),DAT(4,20),XX(4),YY(4),YY1(4)
1430 YY(0)=60:YY(1)=60:YY(2)=60:YY(3)=
60
1440 SI=2:PM=0:ADD=0:FLAG=1
1450 XX(0)=100:XX(1)=120:XX(2)=140:XX(
3)=160:FLAG=0
1460 POKE 559,46:Q=60:? CHR$(125);"PLA
YER DESIGNER":? "BY Stephen Williamson
"
1470 POSITION 2,10:? "Please wait ....
"
1480 P=PEEK(106)-40:POKE 54279,P:PMBAS
E=256*P:POKE 53256,SI
1490 POKE 704,40:POKE 705,72:POKE 706,
120:POKE 707,200
1500 POKE 53248,100:POKE 53249,120:POK
E 53250,140:POKE 53251,160:POKE 53277,
3
1510 FOR J=1590 TO 1676:READ A:POKE J,
A:NEXT J
1520 FOR J=1536 TO 1585:READ A:POKE J,
A:NEXT J:A=USR(1536)
1530 FOR J=0 TO 150:POKE PMBASE+J,0:NE
XT J
1540 POKE 53256,0:POKE 53257,0:POKE 53
258,0:POKE 53259,0
1550 ? CHR$(125):FOR Y=1 TO 20:FOR X=1
 TO 8
1560 POSITION X+1,Y:? ".":CH(X,Y)=46:C
H(X+8,Y)=46:CH(X+16,Y)=46:CH(X+24,Y)=4
6:CH(X+32,Y)=46
1570 POKE PMBASE+499+Y,0
1580 DAT(0,Y)=0:DAT(1,Y)=0:DAT(2,Y)=0:
DAT(3,Y)=0
1590 NEXT X:NEXT Y
1600 POKE 623,0
1610 X=2:Y=1:X1=2:Y1=1:GOSUB 660
1620 GOSUB 1260:POKE 764,255
1630 POSITION X,Y:? ".+";
1640 RETURN
```

**Get it right!**

| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 10 | 14651 | 20 | 16910 | 30 | 15706 |
| 40 | 15706 | 50 | 14596 | 60 | 1951 |
| 70 | 3530 | 80 | 2458 | 90 | 16449 |
| 100 | 14915 | 110 | 7354 | 120 | 6818 |
| 130 | 6930 | 140 | 6943 | 150 | 7147 |
| 160 | 4814 | 170 | 6930 | 180 | 8528 |
| 190 | 8535 | 200 | 8540 | 210 | 8576 |
| 220 | 17478 | 230 | 10753 | 240 | 10709 |
| 250 | 1430 | 260 | 4381 | 270 | 1983 |
| 280 | 8526 | 290 | 8321 | 300 | 8312 |
| 310 | 8323 | 320 | 8178 | 330 | 8173 |
| 340 | 8172 | 350 | 8173 | 360 | 5116 |
| 370 | 13061 | 380 | 1498 | 390 | 4525 |
| 400 | 5678 | 410 | 4306 | 420 | 575 |
| 430 | 4564 | 440 | 4585 | 450 | 4708 |
| 460 | 4718 | 470 | 5286 | 480 | 3334 |
| 490 | 13954 | 500 | 4872 | 510 | 6276 |
| 520 | 11121 | 530 | 2401 | 540 | 6709 |
| 550 | 6719 | 560 | 6729 | 570 | 6739 |
| 580 | 4533 | 590 | 6174 | 600 | 4477 |
| 610 | 4523 | 620 | 4585 | 630 | 4594 |
| 640 | 7157 | 650 | 5662 | 660 | 12345 |
| 670 | 10017 | 680 | 5678 | 690 | 4392 |
| 700 | 5682 | 710 | 7347 | 720 | 7351 |
| 730 | 9789 | 740 | 1498 | 750 | 4518 |
| 760 | 10944 | 770 | 4549 | 780 | 3695 |
| 790 | 9257 | 800 | 7385 | 810 | 3780 |
| 820 | 9564 | 830 | 4385 | 840 | 4785 |
| 850 | 1382 | 860 | 2967 | 870 | 3644 |
| 880 | 1498 | 890 | 4369 | 900 | 3929 |
| 910 | 2549 | 920 | 2102 | 930 | 4739 |
| 940 | 2582 | 950 | 1347 | 960 | 4176 |
| 970 | 4179 | 980 | 4182 | 990 | 4185 |
| 1000 | 4188 | 1010 | 4191 | 1020 | 4194 |
| 1030 | 4197 | 1040 | 4200 | 1050 | 4203 |
| 1060 | 3735 | 1070 | 4417 | 1080 | 9564 |
| 1090 | 4191 | 1100 | 2121 | 1110 | 2323 |
| 1120 | 5701 | 1130 | 5624 | 1140 | 575 |
| 1150 | 4452 | 1160 | 9623 | 1170 | 9322 |
| 1180 | 1855 | 1190 | 4191 | 1200 | 11750 |
| 1210 | 11848 | 1220 | 11868 | 1230 | 11893 |
| 1240 | 1498 | 1250 | 5612 | 1260 | 11880 |
| 1270 | 8327 | 1280 | 1498 | 1290 | 2012 |
| 1300 | 3410 | 1310 | 3256 | 1320 | 4426 |
| 1330 | 12129 | 1340 | 10715 | 1350 | 13216 |
| 1360 | 12068 | 1370 | 4275 | 1380 | 10967 |
| 1390 | 11519 | 1400 | 9233 | 1410 | 4789 |
| 1420 | 11385 | 1430 | 6202 | 1440 | 4156 |
| 1450 | 7810 | 1460 | 14993 | 1470 | 7007 |
| 1480 | 10110 | 1490 | 8552 | 1500 | 12476 |
| 1510 | 7593 | 1520 | 9688 | 1530 | 6989 |
| 1540 | 8788 | 1550 | 6712 | 1560 | 15260 |
| 1570 | 3755 | 1580 | 7715 | 1590 | 2914 |
| 1600 | 1836 | 1610 | 5044 | 1620 | 4299 |
| 1630 | 3642 | 1640 | 1498 | | |



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**PAGE 6** - *COMPLIMENTING AND EXPANDING THE WORLD OF ATARI*

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START OF A NEW SERIES



# Control it – with a mere wave of your hand

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We'll also look at remote keyboards customised for children, disabled people or ham-fisted amateurs. Energy saving aids, acoustic interfaces and simple robotics.

All these are driven by software written in Basic or by simple USR-level machine code routines.

All the gadgets work through the joystick ports and this month we will explore the various signals you can put in and get out. Figure I shows the pin functions.

Pins 1 to 4 are the main on or off signal lines and they are normally held at +5v by internal circuitry. A signal occurs when the line is taken to

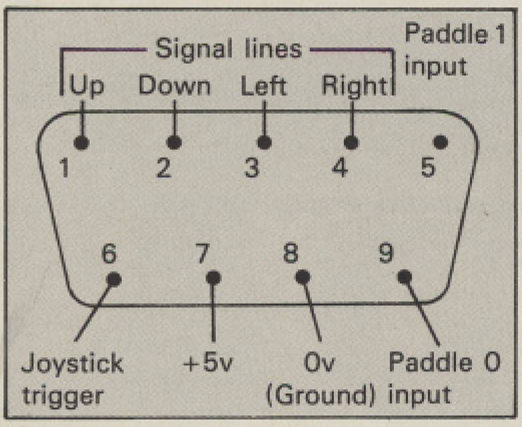



*Figure I: Joystick port pin-outs*

0v by some external means, like a joystick. You can plug a switching device of your own to port 1, and read its output by PEEK STICK(0), or PEEK (632).

The pattern of highs and lows on the four signal lines is interpreted as a 4 bit binary number with 0v meaning on and +5v meaning off, so a number between 0 and 15 will be returned.

It's best if the transition from +5v to 0v is rapid so sensors which produce a slowly changing output, like temperature-sensitive resistors, are not really satisfactory. Devices that switch quickly – like photodiodes or keyboard switches – are suitable, so long as they can handle at least 1 milliamp per line.

The signal lines can easily be turned into output switches. POKE 54018, 56 – POKE 54016, 255 – POKE 54018, 60 – to set up both ports for output, then POKE a number between 0 and 255 into 54016. The number will appear in binary form at port 1 – bits 0 to 3 – and port 2 – bits 4 to 7.

In output mode pins 1 to 4 are held at +5v while they are off and fall to 0v when they switch on. They can each sink 15mA in the on state, which is enough to control transistors, thyristors, LEDs and integrated circuit devices.

Some form of current and voltage amplification will normally be needed before these outputs can do useful work in the outside world, but with appropriate hardware you could control appliances the size of Tower Bridge. More about this next month.

**By LEN GOLDING**

Pin 6 is the joystick trigger line. It can't be made into an output, but remains effective as an input regardless of how the four signal lines are configured.

Taking this pin to 0v will change the number in address 644 from 1 to 0. This opens the way for simple feedback – a motorised device driven by pins 1 to 4 could send a stop signal when it had finished opening a door or drawing the curtains.

The pin could also be used as a fault line, triggering an alarm if anything went wrong with the hardware. As with the signal pins 1 milliamp of current is required to make it operate.

Pin 7 is connected to the "positive" side of the internal power supply, and is held constantly at +5v. It will deliver 500 milliamps or more if you let it, but Atari specify a maximum current drain of 50mA, shared between the ports.

If you try to draw more you could end up with an expensive smell, so it's a good idea to build some form of current-limiting protection into any circuit that draws power from this pin. A 50mA quick-blow fuse is used in the gadgets we will be describing.

Pin 8 is the common 0v line. It connects to all the rest of the computer circuitry and provides the 0v point for signal and trigger inputs.

Pins 5 and 9 are analog inputs designed for use with paddles. A variable resistance can be connected between either of these pins and the +5v line. The computer measures this resistance, converts it into a number between 1 (1k or less) and 228 (500k or more) and then puts the result into address 624 (pin 9) or 625 (pin 5).

These pins continue to work as inputs even when the signal lines are outputting data, so complex feedback is possible. The obvious use is for servo sensors in robot arms.

Pins 1 to 4 can control motor

→

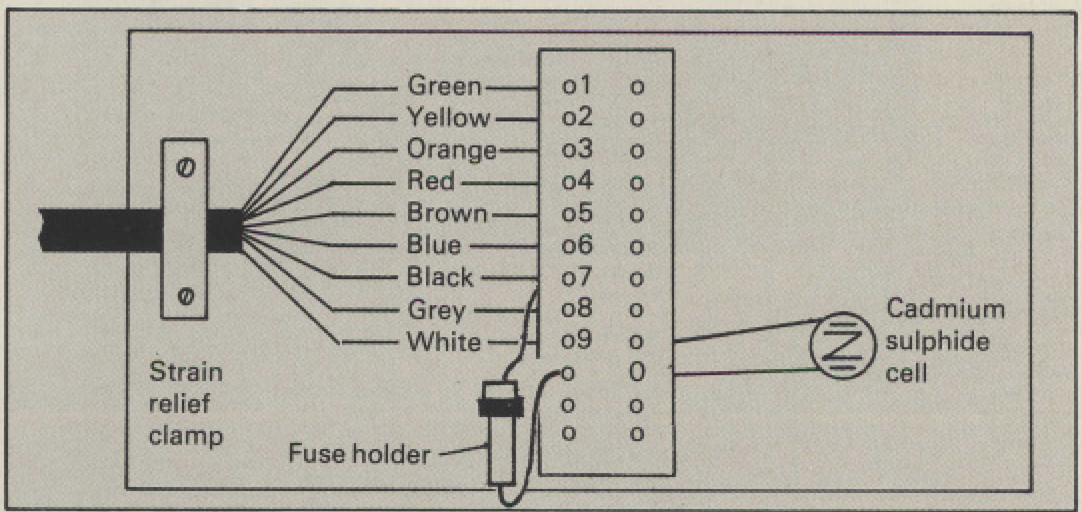



*Figure II: Practical layout*

on/off lines, while variable resistors connected to pins 5 and 9 monitor the degree of rotation in two dimensions.

The analog inputs can also be used for devices which produce a slowly changing voltage. How about a photocell to set a burglar-deterrent program running when it gets dark? Or sensors to control temperatures and exposure times in your darkroom? Or a humidity monitor for the conservatory? Or a transducer that will react to sound? It's all possible without too much knowledge of electronics.

Here's a simple light-sensitive gadget to get you started. You will need the materials shown in the parts list. First test the extension lead using joysticks and paddles in the usual way. If all is well unplug it, cut off the end you don't need and carefully strip about $\frac{1}{2}$in of insulation from each of the nine wires.

Screw the terminal block to the baseboard and attach the wires as in Figure II. The colours shown are those used in the Tandy extension lead – other makes may be different.

Now fit the cadmium sulphide cell on the terminal block as shown, check that all the screw terminals are tight and then plug the gadget into port 1. Run this program:

```
10 POKE 752,1:PRINT CHR$(125)
20 POSITION 2,2:PRINT PEEK(624);"  "
30 GOTO 20
```

Initially the displayed number will be low – probably less than 10 – but if you now cover the cell with your hand the number will rise rapidly to 50 or more. Try this:

```
10 SOUND 0,PEEK(624)+10,10,8: GOTO 10
```

and you get a light-activated swanee whistle guaranteed to delight even the youngest members of the family.

Shopkeepers could use this device to make their window displays more alluring. Fit extension leads to the cell and tape it inside the window so that passers-by can cover it with their hands. Then write appropriate software to generate something interesting on the TV screen when the number in 624 exceeds your threshold value.

A similar gadget can also be used to help train hand coordination in severely disabled children who have little control over body movement. Random waving will have no effect, but careful positioning of the hand can be made to produce some form of reward.

● *Next month we'll explain how to use the four signal lines as output switches and how you can get them to control high power appliances.*

**Parts list**

Joystick extension lead (Tandy 276-1978 or similar).
Cadmium sulphide cell – ORP12 or equivalent. (Maplin type HB10L, Tandy 276-116A or similar).
50mA quick blow fuse and holder.
12 way 5 amp moulded terminal block (Maplin HF01B, Tandy 61-7009 or from most electrical shops).
Baseboard (about 6in × 12in preferably 12mm or 15mm ply).
Total cost around £6.50.

# BASIC COMPILER

Concluding FRANK O'DWYER's series

**IN this final part of the compiler series I'll give those commands which the compiler provides but which have no direct equivalent in Atari Basic.**

Firstly let me introduce the concept of a named procedure. These are like subroutines, but they differ from them in the fact that each named procedure can have its own local variables, and that a named procedure not surprisingly has a name. To handle named procedures the Compiler Basic has three new keywords – DEFPROC, VAR, and ENDPROC.

Using these keywords let's define a named procedure called DELAY which loops around doing nothing for a short time. We could use a FOR . . . NEXT loop to provide the delay, say FOR N (=1) TO 1000. Here's a possible solution:

```
2000 DEFPROC DELAY
2010 VAR N
2020 N=1: FOR N TO 1000: NEXT N
2030 ENDPROC
```

Note the use of VAR N in line 2010 which declares N to be a local variable. In effect this means that the procedure DELAY has its own private variable called N which no one else may use. Another way of looking at it is that if any other procedure or program is using N for some purpose then calling procedure DELAY will not cause N to be corrupted. An example will make this clearer:

```
1000 N=0: FOR N TO 100
1010 PROC DELAY
1020 NEXT N
```

PROC is similar to GOSUB – it just causes DELAY to be executed. Notice that this piece of code uses N for its loop counter, as does DELAY. However DELAY uses its own private variable called N and this is quite separate from the variable used in lines 1000 to 1020. The compiler will quite happily keep track of the two variables even though you might expect it to become confused.

This powerful feature of the compiler allows you to develop self-contained procedures with their own variables. You can then safely use these in your programs without having to worry about what variables you used and whether or not they clash with the variables in your current program – which is more than likely with variable names just one letter long. Programming in small packages like this is sometimes called structured programming.

Another construct which lends itself to structured programming is the REPEAT . . . UNTIL loop. This allows you to repeat a sequence of statements until some condition becomes true. For example:

```
REPEAT:PROC DOSOMETHING:UNTIL F=1
```

This will execute the procedure DOSOMETHING repeatedly until F is set equal to 1. It is a clearer way to write the loop than using IF . . . THEN . . . GOTO.

And now on to what is possibly the most powerful feature of the compiler – the keywords which deal with timed interrupts. These are ENTER, AFTER, ENTRY and EXIT. The ENTER command is a little like GOSUB. Here's an example of it being used:

```
ENTER ROUTINE: AFTER 10
```

What this means is enter the piece of code called routine, but wait until after 10 jiffies (50ths of a second) have expired. While the program is waiting for the 10 jiffies to elapse it simply continues executing the statements in your program. Once the time limit is up the program stops whatever it is doing and enters the routine which you have specified.

Once the routine has executed to completion the program resumes executing where it left off. You may be asking yourself what the point of it is, but I can assure you that it is extremely useful – how does interrupt-driven music in perfect tempo grab you?

Before I show you how you might go about that here's how you set up an entry routine as I call them. You simply bracket the code to be entered with the keywords ENTRY and EXIT as follows:

```
1000 ENTRY ROUTINE:PROC
DOSOMETHING:EXIT
```

Of course you don't have to call your ENTRY routine by the name ROUTINE, any name will do.

Program I provides a procedure called SET UP MUSIC which starts the music playing when you execute PROC SET UP MUSIC. The DATA statements in lines 8090 to 8110 are the data for the music. These are pairs of items – pitch and duration.

There are 12 notes in the example data list, but you can have as many as you want. The numbers were chosen at random so I doubt if it sounds that good. Note that the ENTRY routine ties up variables P and D and also

→

```
8000 DEFPROC SET UP MUSIC:RESTORE MUSIC LIST
8010 ENTER MUSIC: AFTER 1
8020 ENDPROC
8030 ENTRY MUSIC
8040 READ P:IF P=0 THEN RESTORE MUSIC LIST:GOTO 8040 ENDIF
8050 SOUND 0,P,10,8
8060 READ D:AFTER D
8070 EXIT
8080 LABEL MUSIC LIST
8090 DATA 2,3,4,5,6,7,8,9
8100 DATA 9,10,11,12,13,3
8110 DATA 14,16,19,23,30,4
8120 DATA 0:REM END OF LIST
```

*Program I: Music demo*

requires the exclusive use of the READ . . . DATA mechanism, so the main program mustn't use the READ or RESTORE keywords.

Note also that line 8060 uses AFTER without an ENTER keyword – this is perfectly valid and simply means Call me again after 1/50th of a second. It is a fairly simple matter to change this program so that it deals with all four sound channels and/or the distortion and volume parameters.

If you try this bear in mind that you can't have very much code in between the ENTRY and EXIT keywords. This is because the time available for an ENTRY routine to execute in is very limited. For this reason you should keep your routines as short as possible – exactly how short is a matter of trial and error.

There are still a few compiler commands I haven't dealt with. These are ZERO, INC, DEC, BASIC, CODE, ENDCODE and a special version of GET. ZERO simply sets variables to be equal to zero. ZERO A,B,C for example is just a shorthand for A=0,B=0,C=0.

It will also execute quicker than the assignments. INC and DEC are similar to ZERO. They increment and decrement vriables respectively. INC A,B,C is equivalent to A=A+1,B=B+1,C=C+1. Similarly DEC A,B,C is the same as A=A–1,B=B–1,C=C–1.

The command GET may be used to read a character from the keyboard. GET K will wait for a key to be pressed and will set K equal to the ATAscii code of the key being pressed.

The command BASIC may be used to return your USR function – remember compiler programs end up as USR functions – to Basic. You can use the keyword on its own or follow it with an expression.

BASIC 2 for example will cause the value 2 to be returned as the answer given by the USR function. You can have more complex expressions too, such as BASIC X/256 which will return the hi-byte of X to Atari Basic.

While we're on the subject of the USR function you may have been wondering what becomes of the USR function's arguments when the function is executed. The answer is that they are slotted into the compiler's variables A to Z as follows:

- A will equal the number of arguments (0 if there were none)
- B will equal the first argument, if any
- C will equal the second argument, if any, and so on with Z equalling the 25th argument, if any!

So if your compiled program is called with X=USR(14336,1,2,3) you will find that A will equal 3, B will equal 1, C will equal 2 and D will equal 3. You can ignore this or you can check A to see if there have been any arguments, and give an error message or process the arguments as appropriate.

Whatever you do there is no danger of the arguments being left on the stack and crashing the computer – the compiler looks after the stack. See Programs II and III for examples of compiler programs which process arguments.

The only keywords left are CODE and ENDCODE. These allow you to

```
1000 IF A<>1 THEN PROC ERROR ENDIF: REM WRONG NUMBER OF ARGUMENTS
1010 PROC COPY
1020 PROC MODIFY
1030 BASIC B/256: REM RETURN HI-BYTE TO BASIC
1040 DEFPROC COPY
1050 VAR S,B
1060 S=756#*256: REM BASE OF ROM CHARACTER SET
1070 FOR S TO S+[8*128]:POKE B,S#: INC B: NEXT S: REM COPY TO RAM
1080 ENDPROC
1090 DEFPROC MODIFY
1100 VAR C,S,D
1110 RESTORE NEWCHARS
1120 REPEAT:READ C: REM READ CODE OF CHARACTER TO MODIFY
1160 IF C<>255 THEN
1170 S=C*8+B:FOR S TO S+7:READ D:POKE S,D:NEXT S: REM REDEFINE THIS
CHARACTER
1180 ENDIF
1190 UNTIL C=255
1200 ENDPROC
1210 REM DATA FOR NEW CHARACTER SET FOLLOWS
1220 DATA 1,255,129,129,129,129,129,129,255
1230 REM INSERT YOUR OWN DATA HERE...
1240 DATA 255
1250 DEFPROC ERROR
1260 PRINT 253:PRINT "CHARACTER DEFINE - BAD ARGUMENTS":PRINT
1270 BASIC 756#: REM RETURN OLD CHARACTER SET HI-BYTE
1280 ENDPROC: REM NOT REALLY NECESSARY!
```

*Program II: Do not type in REM statements as they use too much memory in a 16k machine*

embed assembly language in your compiled programs. The only restrictions are that you must leave the Y register equal to zero when you finish and that each instruction must be on its own line. Here's an example:

```
1000 DEFPROC DONOTHING
1010 CODE
1020  NOP
1030  NOP
1040 ENDCODE
1050 ENDPROC
```

Note the spacing of these lines – two spaces before the assembler instructions and one before CODE and ENDCODE. You should follow this exactly. You may put anything between the keywords CODE and ENDCODE which the assembler recognises – you are effectively talking directly to the assembler without the compiler's intervention until it spots the keyword ENDCODE.

Well that's it. By now you should have a good idea of what can and cannot be done with the compiler. Let me leave you with two example programs. Program II is a routine to redefine the character set. It takes one argument, the address to which the character set is to be moved – this should be a pointer to free space of 1k in size.

You can call the routine with X=USR(14336,CHBASE) where CHBASE is the address where you want the character set. X will be set to the hi-byte of CHBASE. Simply POKE 756 with X and you will have redefined the character set.

The whole process – copying the ROM set and poking the bytes for the new character definitions – takes about 1/10th of a second. Compare this with the usual please wait message while an Atari Basic program redefines the character set.

Program III is an alarm clock routine. It takes one argument, the number of jiffies which you want to elapse. After this number of jiffies has elapsed you will hear a beeping sound and the message "Wakey Wakey!!" will be displayed on the screen. Although just a toy program really, it does demonstrate the ability of ENTRY routines to work concurrently with Atari Basic.

To call the routine try X=USR(14336,1000). The computer will reply READY. You can carry on typing but after 1000 jiffies – about 20 seconds – the fun begins.

One final program. Remember I said that PRINT cannot display a number on the screen but that you could write a routine to do it? Here it is, presented as a named procedure. It will display the contents of the variable N on the screen. To print an expresssion just set N equal to the expression and call PROC PRINT N.

```
8000 DEFPROC PRINT N
8010 VAR C,S,N,D
8020 ZERO S
8030 D=10000
8040 REPEAT
8050 C=N/D:N=N/D:D=D/10
8060 IF D=0 THEN S=1 ENDIF
8070 IF C|S THEN PRINT C+'0:S=1 ENDIF
8080 UNTIL D=0
8090 ENDPROC
```

```
1000 ZERO T: REM SET TIMER TO ZERO
1010 ENTER TICK:AFTER 1: REM SET TIMER ROUTINE GOING
1020 BASIC: REM BACK TO BASIC

1030 ENTRY TICK
1040 DEC B: REM COUNT B DOWN TO ZERO (B IS THE ARGUMENT GIVEN BY THE
USER)
1050 IF B=0 THEN ENTER ALARM ENDIF: REM IF TIME UP THEN ALERT USER
1060 AFTER 1: REM CALL ME AGAIN AFTER 1 JIFFY
1070 EXIT: REM RESUME INTERRUPTED PROGRAM

1080 ENTRY ALARM
1090 X=10:Y=0:S="/WAKEY WAKEY!!/"
1100 PROC PRINT S: REM DISPLAY MESSAGE
1110 SOUND 0,50,10,8: REM MAKE A NOISE
1120 ENTER QUIET:AFTER 10: REM CALL QUIET TO STOP NOISE AFTER 10
JIFFIES
1130 EXIT

1140 ENTRY QUIET
1150 SOUND 0,0,0,0: REM SILENCE CHANNEL 0
1160 X=10:Y=0:S="/             /": REM 13 SPACES
1170 PROC PRINT S: REM BLANK OUT MESSAGE
1180 ENTER ALARM:AFTER 10: REM FLASH MESSAGE AGAIN AFTER 10 JIFFIES
1190 EXIT

1200 DEFPROC PRINT S
1210 VAR T,C,D,X,S
1220 T=S@:INC S
1230 X=88@+X:X=Y*40+X
1240 REPEAT
1250 IF 88@+[40*24]>=X THEN GOTO OVERSHOOT ENDIF
1260 D=S@:INC S
1270 IF D<>T THEN C=D:PROC CONVERT C:POKE S,C:INC X
1280 ENDIF
1290 UNTIL D=T
1300 LABEL OVERSHOOT
1310 ENDPROC

1320 DEFPROC CONVERT C
1330 IF C<32 THEN C=C+64:GOTO DONE ENDIF
1340 IF C<96 THEN C=C-32 ENDIF
1350 LABEL DONE
1360 ENDPROC
```

*Program III: Alarm clock. Again don't type the REM statements in*

# Compiler Library for the XL and XE

THERE was a small omission in the machine code Compiler Library listing in the April issue. Put simply, it will not function correctly if you have an XL or XE computer, although it works fine on the old 400/800 machines.

To correct the program so that it will work on both types of machine plug in your Assembler/Editor cartridge and ENTER the original program from tape or disc.

Now add the new lines (right) and LIST it back on to your tape or disc. Lines 2 and 10 remove the references to the old EOUTCH and GET routines, while lines 510 to 525 allow the program to find out which sort of computer it is running on, in order to jump to the relevant EOUTCH or GET subroutine.

```
02 ;COMPILER LIBRARY WITH XL/XE MODS.
10 OSTEST =  $FCD8
0509 ;MODS FOR XL/XE 'EOUTCH' & 'GET'
0510 EOUTCH PHA
0511      LDA OSTEST
0512      CMP #$A2
0513      BNE EOUT1
0514      PLA
0515      JMP $F6A4
0516 EOUT1 PLA
0517      JMP $F2B0
0518 GET PHA
0519      LDA OSTEST
0520      CMP #$A2
0521      BNE GET1
0522      PLA
0523      JMP $F6E2
0524 GET1 PLA
0525      JMP $F2FD
```



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# Dungeon trilogy is on its way



**AFTER all the excitement of the Atari Show I seem to have a brief lull between games being released and arriving for review, so it gives me a chance to catch up with my mailbag and to look at an older game from the Infocom Wizards.**

First out of the bag is Phillip Turner playing the excellent Dungeon Adventure from Level 9. By the way I hear that the whole dungeon trilogy is to be released soon – good news for anyone wanting to get into adventuring in a Colossal way.

Despite being called Brillig the Brilliant – flattery will get you part of the way – I am loathe to solve a list of problems, as often the solution to one will lead on to others without further help being required.

So Phillip to get past the siren you need to turn deaf ears to her call. To do that arm yourself with some seeds that may make your ears go a bit poppy.

Also having trouble with Level 9 is Michael Byrne from Eire who is playing Red Moon. Among other things he is being blinded by the flashing lights. To stop these dazzling you need to think like a mason.

They use something round and dark to get rid of the things they don't want. So drop it there. Also if you saw April's glitch column you may know how to swim and breathe underwater, but it is easier than you think.

Another question about Red Moon comes from Colin Brunt of Rotherham who asks why the keyboard locks up in mid-game and he has to switch off and reload. Any ideas folks? Colin says he is going to cast the Zapping spell at his computer if it happens again.

Richard Burke of Gwent is one of several readers stuck in The Pay-off from Atari/Bignose. Never mind the bone for the dog, Richard. He wants something far more juicy, so why not spice it up for him a little and let him

**By Brillig**

make good use of the kennel?

As for the picture, you need to have a good feel for what you are looking for, but the desk should help you get the right combination.

Duncan Husband was smashed on the nose when he attempted to climb the fence. By whom he asks? The fence of course Duncan – oh that sort of fence. Well it is an almost deserted car-park.

Last of this month's Help batch goes to Sharon Brizell of Chester who is stuck in Morden's Quest. She wants to get past the pygmy and the carnivorous plant.

To get past the first you need some puff and a tube with thorns and berries to load it.

Once you have done that guess what you need for the second. As I said earlier one solution often opens

→

## Glitches of the Month:

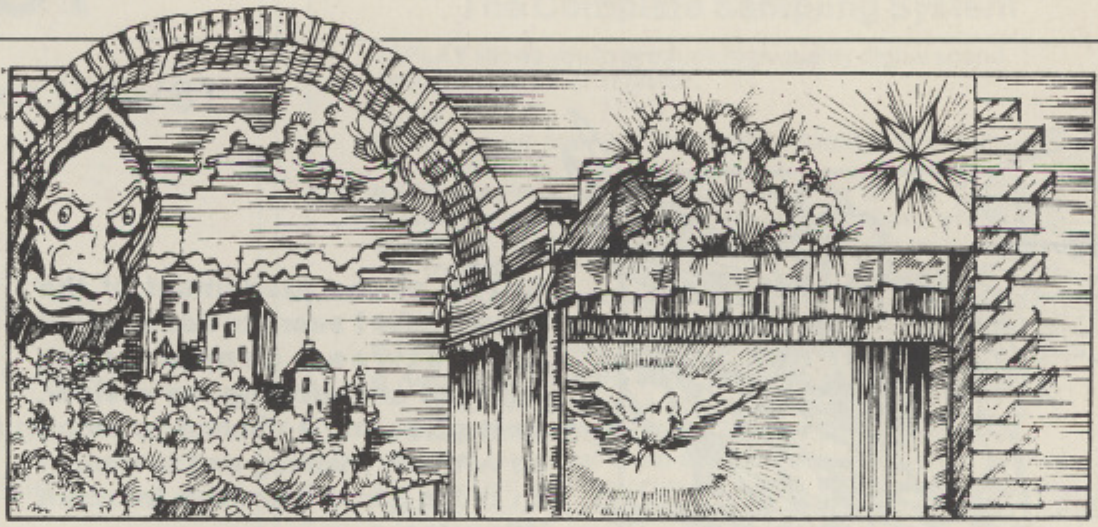
**Vic Rowlands has finally finished The Pay-Off and is now hooked on adventures. He found an interesting glitch in the game and wins this month's T-shirt.**

**Desperate to get into the vault after a good deal of drilling Vic went hunting for things to help him get in.**

**After transporting the entire contents of New Jersey to the bank he found the correct item near the start of the game – ain't it always the way – but on arriving at the Bank found that his handiwork had been repaired.**

**Someone got a nice lot of weekend overtime to do it, but fortunately for Vic they had left the tools lying around and he finished the game.**

**A medium size T-shirt for you Vic, as you forgot to state your size. If this is too small for you pass it on to your wife for the valuable hints she gave you.**



up ideas for solving other problems.

Now a plea for assistance for two patient adventurers playing a game I know not, Synsoft's Quasimodo. Dave and Joy are going bananas trying to get the second lot of jewels back to their rightful home from the bell tower.

If anyone can help them send the answer to me by first class carrier pigeon and I will pass on the solution. Don't give up Dave and Joy, we'll save you yet.

As magic seems to be the trendy theme for adventures I have reviewed Infocom's new release, Spellbreaker. The third of the Enchanter trilogy sent me scuttling back to the original game for a play.

You play an inexperienced Enchanter sent to combat the might of the evil Krill whose power is rising in a castle to the east.

Armed with only a few weak spells you are despatched by Belboz the necromancer to do your best. The most charitable thing that you can say about Belboz is that he does revive you each time you get killed.

Like any sensible person sent to deal with evil in the east I rapidly set out west, only to be caught by the series of signs asking me why I was doing just that.

Ashamed I slunk back through the almost deserted castle village to attend my gruesome fate and gruesome it was. I was imprisoned and then sacrificed on a bloody altar, only to be revived and returned.

The game pervades evil and the oppressive feeling of being spied on. It is an excellent example of how to transport you to another time and place, and give you a real sense of being there.

The scribe facility is a boon to remember the complicated spell names, and the standard of prose never falls below superb. If you want to be a sorcerer's apprentice look no further then Spellbreaker.

Next month I shall look at the work of another well known adventure author, Jim Pearson, but until then keep making those maps.

# How much it costs to use MicroLink

**Initial registration fee:** £5.

**Standing charge:** £3 per calendar month or part.

**Connect charge:** 3.5p per minute or part – cheap rate; 11p per minute or part – standard rate.
*Applicable for duration of connection to the Service. Minimum charge: 1 minute. Cheap rate is from 7pm to 8am, Monday to Friday, all day Saturday and Sunday and public holidays; Standard rate is from 8am to 7pm, Monday to Friday, excluding public holidays.*

**Filing charge:** 20p per unit of 2,048 characters per month.
*Applicable for storage of information, such as telex, short codes and mail files. The number of units used is an average calculated by reference to a daily sample.*

**Information Databases:** Various charges.
*Any charges that may be applicable are shown to you before you obtain access to the database.*

**MicroLink PSS service:** 2.5p per minute or part (300 baud); 3p per minute or part (1200/75 baud).
*Only applies to users outside the 01-London call area.*

**Telex registration:** £10.

**Outgoing telex:** 5.5p per 100 characters (UK); 11p per 100 (Europe); 18p per 100 (N. America); £1.25 per 400 (Rest of world); £2.75 per 400 (Ships at sea).
*Deferred messages sent on the night service are subject to a 10 per cent discount.*

**Incoming telex:** 50p for each correctly addressed telex delivered to your mailbox. Obtaining a mailbox reference from the sender incurs a further charge of 50p.
*It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address. Each user validated for telex and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of telex storage and the use made of short code and message file facilities.*

**Telemessages:** £1.25 for up to 350 words.
*Telemessages can be sent with an illustrated greetings card for 65p extra.*

**Radiopaging:** No charge.
*If you have a BT Radiopager you can be paged automatically whenever a message is waiting in your mailbox.*

**International Mail:** For the first 2,048 characters – 20p to Germany and Denmark; 30p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 1,024 characters – 10p; 15p.
*These charges relate to the transmission of information by the Dialcom service to other Dialcom services outside the UK and the Isle of Man. Multiple copies to addresses on the same system host incur only one transmission charge.*

**Billing and Payment:** All charges quoted are exclusive of VAT. Currently all bills are rendered monthly.

## Software over the telephone

MicroLink is setting up a central store of software programs which you'll be able to download directly into your micro. The range will include games, utilities, educational and business programs, and will cover all the most popular makes of micros.

## Talk to the world – by satellite

MicroLink is part of the international Dialcom network. In the USA, Australia and a growing number of other countries there are many thousands of users with electronic mailboxes just like yours. You can contact them just as easily as you do users in Britain – the only difference is that the messages from your keyboard go speeding around the world via satellite.

## What you need to access MicroLink

You must have three things in order to use MicroLink: a computer (it can be any make of micro, hand-held device or even an electronic typewriter provided it has communications facilities), a modem (it can be a simple Prestel type using 1200/75 baud, or a more sophisticated one operating at 300/300 or 1200/1200 baud), and appropriate communications software.

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# MULTIPLE DLIs -AND GOLDFISH IN DIRE DANGER

*CAN you give me some guidance on how to put more than one DLI on the screen at once? I never even knew what an interrupt was before I read Mike Rowe's article in the September* Atari User*.*

*A few months ago I ordered a Revision C Basic cartridge from Silica Shop. With it plugged in I ensured it was a C ROM by PEEKing location 43234. This returned 234 – a C ROM. But my 800XL still continued to lock up.*

*I am quite frustrated as to what I do next. If someone won't help me, I'll eat my goldfish.* – **David Manlove, Edinburgh.**

● To use multiple DLIs simply use more mode lines with the 128 added to the display list number.

Each interrupt will go to the same address in memory, but you could then use a small counter routine to work out how many times it has been run, and so what to do next.

Alternatively location 54283 (VCOUNT) will tell your routine how far down the screen the display is at any given time – thus you could work out where the interrupt had happened.

You will almost certainly find that the problems you are experiencing with Basic owe more to a hardware fault than to the bugs in Revision B Basic.

Try taking the machine back to the dealer and explaining the situation. Otherwise, we recommend a medium dry white wine to go with your meal.

## Protocol standard

*I WONDER if you or one of your readers could help me. I need to transfer data from an Atari 800XL to an IBM PC. To do this, I require two communications programs, one for the Atari called AModem and one for the IBM called PC Talk III.*

*I have PC Talk III, but so far I have been unable to locate A Modem and the instructions that go with it.*

*I would be most grateful for any advice you can give me.* – **Louis Alexander, Haslemere, Surrey.**

● Amodem is a protocol standard, not a program. Many comms packages for the 800XL give you either Amodem or its close twin Xmodem for transferring data files.

Try Home-Pak or many of the public domain terminal programs available from user groups.

If you do not have the 850 interface module for RS-232 you could do a lot worse than getting Miracle Technology's DataTari cable and terminal software package.

## File end dilemma

*AS a user of an Atari 800XL and 1050 disc drive I have come across a problem for which I can find no answer either in* Atari User *or my user manuals.*

*I am experimenting with the commands to open channels to the disc drive in order to write data to a named file – OPEN #1,8,0,"D:BANKFILE" to write data to the file and OPEN #1,4,0,"D:BANKFILE" to read from the file within a program.*

*I have succeeded in writing a program to give screens to ask a user to update a file called bankfile with new cheque details and so on and to erase details.*

*My problem is coming to display the read data. I can get the program to read and display the data from Bankfile using OPEN#1,4,0"D:BANKFILE" which is all OK, but as soon as the end of the file is arrived at after displaying all the data I get Error code 136 (program tried to read data after getting end-of-file).*

*Is there any recognised statement that tells the program that "at the file end" do something.*

*I feel sure that there must be a standard At end of file phrase which I do not know about, can you please help me out?* – **J.J. Mold, Matlock, Derbyshire.**

● Other than using a standard terminator such as "End", as you have said, you could have used the following line:

```
10 TRAP 1000:REM
GOES TO LINE 1000 IF
AN ERROR OCCURS
```

to send the program to a new line when the error occurs. You could then check PEEK(195) to find the error number.

If it is 136 (End of file), you could do whatever you need to in that case. Otherwise, you should handle the error in whatever way you feel appropriate, or halt with some form of printed "Error has occurred" message.

The most elegant method is still to exit gracefully via a rouge record, with a neat TRAP to handle any errors in the file.

## Bring on Brataccas

*THANKS for your magazine. At last the definitive issue for the long forgotten Atari users.*

*The ST software page was appreciated, but what happened to Brataccas by Psygnosis, a game with an in-depth review crying out to be written?*

*Something you might like to consider would be reviewing Atari arcade games from time to time. Some time ago now I had the pleasure of playing Marble Madness at Southend, and what an experience that was.*

*Played with a track-ball built into the machine, it's a game I can recommend to all Atari fans.*

*For some time now I have envied users of the Quill creating works on lesser machines, so please has anyone heard of a similar program for Atari users?* – **Geoff Redburn, Milton Keynes.**

● Try Adventure Writer, by Code Writer – if you can find one!

## No great saving . . .

*I OWN an 800XL and have recently obtained a CXL 4003 assembler editor, which seems to work perfectly except for two things.*

*The command SAVE #C: which saves object code does not appear to be operating properly.*

*The command ASM,,#C: appears to work properly. However when I try to load the saved object code from Basic, which according to page 65 of the manual it should do, the load routine crashes and no program is loaded.*

*I would be obliged if you could give me any advice on the above and also tell me if this particular assembler cartridge is fully compatible with the 800XL?* – **Dominic S. Smith, Airdrie, Lanarkshire.**

● Your problems are all related to the fact that neither Atari Basic nor the cassette system fully support the normal binary load format of an object file.

For disc users, you just use the Binary Load option on the disc menu. For cassette users, since Basic will not load a binary load file, the file format of a binary save is as follows:

First 2 bytes: $FF $FF (flags)

Next 2 bytes: First Address

→

(Lo/Hi format)

Next 2 bytes: Last Address to load (Lo/Hi format)

Then follows the data to go in the addresses specified. There may be further segments of data, each with the same format (although the $FF $FF is optional after the first segment). Thus, to load each segment, use something like this:

```
10 REM READ A BINARY LOAD FILE FROM
   BASIC (N.B: NO RANGE CHECKING!!)
20 OPEN #1,4,0,"D:FILENAME.EXT"
30 GET #1,A:GET #1,B
40 IF A<>255 OR B<>255 THEN PRINT "NOT
   A BINARY LOAD FILE":END
50 GET #1,C:GET #1,D
60 IF C=255 AND D=255 THEN 50
70 START=C+D*256
80 GET #1,E:GET #1,F
90 FINISH=E+F*256
100 FOR RAM=START TO FINISH
110 GET #1,BYTE:POKE RAM,BYTE
120 NEXT RAM
```

You may then GOTO line 50 again, until an End-Of-File happens. Be careful not to write your machine code programs using any areas of memory that Basic uses. Page 6 is an ideal space to use.

# ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

**Mailbag Editor**
**Atari User**
**Europa House**
**68 Chester Road**
**Hazel Grove**
**Stockport SK7 5NY**

## Auto-line feed tip

*IS the Ferguson MC05 colour TV monitor capable of giving medium colour resolution on the ST?*

*The 520ST comes with a high resolution monochrome monitor as standard. If a high resolution (640×400) colour monitor were connected to the ST would it give high resolution colour, high resolution monochrome or a medium resolution output?*

*I have an XE and an ST and want to use both with my Epson printer. The trouble is that although the ST gives an automatic line feed and carriage return output the XE does not.*

*I know that to remedy this I simply have to change the appropriate dip switch on the Epson, but obviously this is a great pain as it means taking the printer apart to do so.*

*Basically all I want to know is how can I change a dip switch without having to dismantle the printer? Can it be programmed or is there a piece of hardware that can be connected?*

*Lastly is the Juki 5520 colour printer any good, worth the cost and compatible with an Atari?*

*Also is Atari planning any full size colour printers? By full size I mean at least 9 inches across. If so how much and when?* – **A.K. Bishop, Chesunt, Herts.**

● The Epson printers all have a pin on the Centronics interface which can select the auto-line feed for you. All you need do is turn the switch to Off, whichever computer you are using, and adapt your 8 bit computer cable to short pin 14 to ground (pin 16).

This will select the feature every time the cable is plugged in.

## Monitor cable

*I WAS very interested in your review of the Sony KX-14CP1 colour monitor in the January issue of* Atari User.

*This interest prompted me to write to Sony (UK) for information regarding a cable for use with their monitor but my letters have been received with the kind of total apathy which no doubt we are both familiar with from large companies – including Atari (UK).*

*I wonder therefore, if you would be kind enough to supply the information I require?*

*I assumed that the prospect of selling such an expensive piece of equipment would guarantee a reply. I was wrong!* – **S. Fallaize, Leigh-on-Sea, Essex.**

● The cable you require is a standard Atari one, as the Sony monitor can accept a cable in almost any form you care to use.

The easiest one to use, should you wish to wire one yourself, would be a DIN plug at the Atari end with two phono type plugs – or a BNC and a phono – at the monitor end. Connect them as follows:

DIN pin 1: N/C

DIN pin 2: Screen (on both other plugs)

DIN pin 3: Phono centre pin

DIN pin 4: BNC centre pin (or other phono if two phonos used)

DIN pin 5: N/C

Simply plug this cable into your Atari and into the Audio In and Video In sockets on the Sony, and it should work fine.

We trust this will solve all of your problems, as we have found it to be a very good monitor indeed.

## Train cancelled

*I OWN an Atari 600 XL with a 16k memory and have tried to program the Alphabet Train shown in your May issue.*

*However I keep getting ERROR 147 at line 280 and ERROR 9 at line 960. How do I put this right?* – **P. Pattinson, Chatham, Kent.**

● Unfortunately the 16k machine doesn't have enough memory for this program.

## Manuals required

*I OWN an Atari 400 and 1010 recorder. The information supplied with both said that I should have a manual I did not receive either.*

*Could you please tell me where I could buy the 400 and 1010 manuals.*

*Also I wish to have my 400 upgraded to 48k. Could you please recommend a relative upgrade and its cost.* – **Jacob Morgan, North Kilworth, Leicestershire.**

● Try Atari, or any main Atari dealers, for the books.

If you can't get Atari's own book there are plenty of others which will provide very much the same information.

As to upgrading your 400, it would be far cheaper to buy an 800XL from Dixons, as the last price I heard of on 48k boards for 400s was about £80.

Once you have done this you could sell off your old 400 and recorder, since the new machine comes with its own anyway.

## That rare 1200 XL

*BROWSING through computer books in W.H. Smith recently, I came across mention of an Atari computer I hadn't heard of before.*

*Several books had references to the Atari 1200XL, and one had a picture. It was in the XL brown and white style but with silver keys across the top of the keyboard and several keys numbered F1, F2 etc along with the Start, Option keys.*

*The cartridge slot was on the side of the machine, which was said to be 64k. I thought*

*the 1200XL had a very smart appearance.* – **P.J. Rixon, Stafford, Beds.**

● The 1200XL was a forerunner to the 800XL, and was never released in the UK. It had a very short life of only a few months in the States, and is something of a collector's item these days.

Apart from the extra function keys and a couple of other minor details, it was simply an 800XL with no built-in Basic. This came as a cartridge, as on the old 400/800 machines.

## Costly button

*YOUR correspondent Mr Ward wrote about the cost of replacing the Play button on his 1010 recorder. My recorder suffered the same breakage and was also under guarantee, but unfortunately the local retailer had closed down.*

*I was reluctant, following previous experience, to make any approach to Atari UK so self help was the answer.*

*Since I had never used the Pause button, and seemed never likely to do so, I decided to make an exchange.*

*As an incompetent mechanic feeling my way, I managed to complete the job successfully in about an hour. I reckon I could do it second time round in 20 minutes, and it seems to me that someone who charges £20 for such a job must be cheating.*

*The job is quite straightforward – firstly, turn the recorder over and remove the four recessed retaining screws. Gently ease off the plastic cover which is partially held by concealed plastic lugs.*

*The buttons hinge on a common rod held in place by a circlip, so ease off the circlip. Then push the rod out of its bearing sufficiently to allow removal of the buttons one by one – take care not to lose the return springs associated with each button.*

*Replace the buttons, leaving the broken one – or new one if you are lucky – in the pause position, and finally reassemble the machine.* – **K.T. Osborn, Costessey, Norwich.**

## Look to your rights

*LIKE F. Ward in the March issue of Mailbag the Play button of my 1010 Atari recorder became disconnected in the 11th month of its 12 month guarantee.*

*I contacted my local Atari service agents who stated that they no longer carry out repairs under warranty – their minimum charge is £25 plus VAT – and I was advised to purchase a new EX11 recorder.*

*However, I then remembered Atari's new policy that retailers should replace faulty items up to 90 days from purchase, and after that the items should be sent to the Atari repair depot at Slough – but I also remembered reading complaints that repairs had been taking between three and six months.*

*Nevertheless, I sent my 1010 to Atari at Slough in January and it was returned to me repaired and certified fully tested within six working days of receipt.*

*The moral of this is – insist upon your rights under the 90 day warranty from your retailer, and after this time – and up to 12 months – return the items direct to Atari at Slough.*

*Don't go to any registered Atari service agents until after 12 months have elapsed – even then you may be told that the charge will be anything between 60 per cent and 85 per cent of a new one.* – **Norman Williamson, Sutton, Surrey.**

## Screen dump modified

*I HAVE made two modifications to the 1020 screen dump in the January issue.*

*If one or more of the colour registers is set to white, that is, paper colour, the printer goes through a pass of that pen which is not needed, doing nothing.*

*My alteration allows you to skip the pen colours that are not used.*

*Add lines 391 to 403 and 851 to 854.*

*The second modification moves the pen and paper quicker by putting the move and draw commands into a string.*

*Change lines 900 and 980, then delete lines 910, 920, 930, 940, 950, 960, 970 and 990.* – **Brian Wright, Hull, N. Humberside.**

```
391 GRAPHICS 0:B$="     ":? :? "DO YOU
 WISH TO SKIP BLACK PEN":INPUT B$:IF B
$="Y" THEN S0=1:GOTO 394
392 IF B$="N" THEN S0=0:GOTO 394
393 GOTO 391
394 B$="     ":? :? "DO YOU WISH TO SK
IP BLUE PEN":INPUT B$:IF B$="Y" THEN S
1=1:GOTO 397
395 IF B$="N" THEN S1=0:GOTO 397
396 GOTO 394
397 B$="     ":? :? "DO YOU WISH TO SK
IP GREEN PEN":INPUT B$:IF B$="Y" THEN
S2=1:GOTO 400
398 IF B$="N" THEN S2=0:GOTO 400
399 GOTO 397
400 B$="     ":? :? "DO YOU WISH TO SK
IP RED PEN":INPUT B$:IF B$="Y" THEN S3
=1:GOTO 403
401 IF B$="N" THEN S3=0:GOTO 403
402 GOTO 400
403 RETURN
851 IF D=0 AND S0=1 THEN NEXT D
852 IF D=1 AND S1=1 THEN NEXT D
853 IF D=2 AND S2=1 THEN NEXT D
854 IF D=3 AND S3=1 THEN NEXT D
900 ? #1;"C";D:? #1;"S2,0*M0,1*D2,1*M0
,2*D2,2*M0,3*D2,3"
980 ? #1;"M0,4*I"
```

## Speedy service

*WHEN writing to magazines most people have complaints to make. I would like to give someone a hearty compliment for a change.*

*My son has an Atari 800XL and he wanted to buy an Atari 1050 disc drive. We looked through the February 1986 issue of Atari User and saw the advertisement by Compumart of Loughborough, Leics, who were offering 10 free discs with their disc drive.*

*I telephoned them on the morning of January 30 and enquired how soon I could expect delivery if I placed my order immediately, and was informed it would be despatched that same day.*

*I placed the order and to the great delight of my son and myself it arrived the following morning.*

*Well done Compumart, I know where I will be placing my orders in future.* – **John Steel, Hounslow.**

## Cassette capers

*I WAS not surprised to hear about Gareth Lowe's cassette capers, I myself was at one time in the same boat.*

*To help those people who use the 1010 cassette recorder, I thought I would give a few tips from my experience.*

*When a program needs to be saved from Basic I suggest an LPRINT command is executed with the printer off line. This clears the buffers of any garbage.*

*Also I would advise that the cassette be fully rewound and advanced to 003 on the counter, as some cassettes have long leaders which interfere with the length of the first tone.*

*I have found that low quality cassettes greater than C30s can cause uneven winding during saving or loading and thus cause crashes.*

*In general though good quality cassettes do not have this problem and I have used up to C90s. I should also add that the Boots C15, described in Gareth's letter, also caused me problems, so I now avoid them.*

*Nevertheless, some programs still refuse to load. There are two methods which usually prove successful in correctly reloading the cassette.*

*The first is to advance and rewind the cassette completely several times, which removes uneven winding.*

*The second is to copy tape to tape using a high quality hi-fi and cassette. A combination of these techniques reduced my cassette failure rate.* – **Lee Charlton, Halesowen, West Midlands.**

● Good advice. Don't forget you only need the LPRINT on old 400/800 machines, not XLs or XEs.

## Stress analysis

*I MAKE stress analysis programs on an Atari 800XL. The following limitations in Atari Basic limit the length and complexity of these projects:*

- *The maximum number of variables available in one program is too small.*
- *The maximum number of ciphers/letters in one line is also restrictive.*
- *Can you help possibly with a short ML program which modifies the basic limitations?*

*The first point means I have to stop a program and make two or three separate ones – a time-consuming and disappointing process.*

*The latter point is really a nuisance as the various components of vector and matrix maths need to be on the same line, otherwise the order in which the various components are read into the computer messes up the answers.* – **J.R. Carter, Holland.**

● The problem of number of variables being too small can be overcome quite easily. Probably the best way to do it would be to use just one array type variable.

Thus you only use up one name in the variable name table, but you could have 10, 20 or 1,000 entries at your disposal.

The second is harder to resolve. Certain increases are possible by using POKE 82,0 to reset the margin, and by using abbreviations wherever possible.

However we don't see any reason why you can't put different parts of your calculations on different lines. Simply split any formulae into parts, then have one final line to calculate the sum of the parts.

The process the computer uses to step along the parts of a single line is exactly the same as that used to step on to a new line, so simply break the problem down into smaller parts and put them on different lines.

## Lighting interface

*COULD you tell me how to connect an Atari 130XE up to lights and have it turning them on and off when a certain key is pressed.*

*Could you also produce an article on an Atari computer controlling different things around the home, such as turning lights on and off at certain times.*

*What type of software would have to be written for both of the above?* – **Paul Myers, Runcorn, Cheshire.**

● Len Golding will be covering this in his series on gadgets which begins in this issue.

## International characters

*WITH reference to your reply to G.O. Dubourg of Mansfield in your December 1985 issue concerning printing the £ sign I would like to add the following information.*

*Not only do you have to turn on the international character set with [CTRL-O] 27 [CTRL-O] 23 but you then have to turn it off again before the end of the line with [CTRL-O] 27 [CTRL-O] 24. If you do not turn if off you*

# Simpler user defined graphics

*AFTER many hours of deciphering user defined graphics by adding up all those numbers, I sat down and wrote a formulae for getting around the problem.*

*Put down on grid paper your UDG, – an 8×8 grid should be used.*

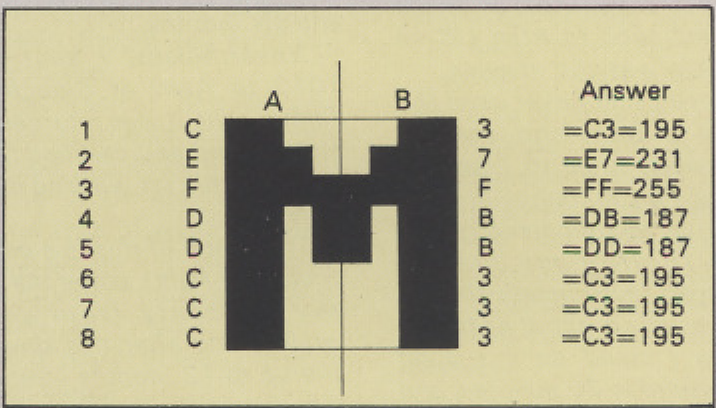
*Draw a line straight down the grid middle and mark sides A and B.*

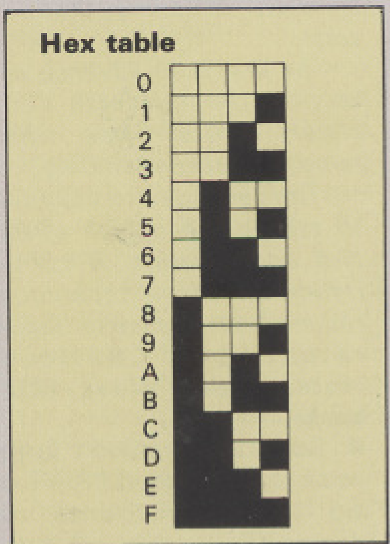
*Write down horizontally numbers 1 to 8 by the side and read 4A as write on left hand side hex code (see hex table).*

*Now carry on 4B the same as 4A thus 2A, 2B, 3A etc, to 8B.*

*Now you take line one hex and convert on the hex to dec. converter. Do all 8 lines.*

*This method can be mastered and can be worked out in the mind. I hope this is a useful formulae.* – **D. Clapson, Shaftesbury, Dorset.**




**Hex to dec. converter**

| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SECOND HEX DIGIT | | | | | | | | | | | | | | | |
| | 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| F | 1 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| I | 2 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| R | 3 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| S | 4 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| T | 5 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 |
| | 6 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 |
| H | 7 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
| E | 8 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 |
| X | 9 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 |
| | A | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 |
| D | B | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 |
| I | C | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 |
| G | D | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 |
| I | E | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 |
| T | F | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 |

*get ó at the beginning of the next line.*

*I have read that one could put [CTRL-O] 27 [CTRL-O] 23 into the print formatting block at the beginning of a file but certainly using AtariWriter and a 1027 printer this does not work because every line starts with ó.*

*I have taken the liberty of enclosing a copy of instructions for obtaining the ICS which I put on disc so that I wouldn't have to keep explaining it to my wife and kids. If you think it is any use, perhaps you could forward it to Mr or Mrs (or even Ms) Dubourg.* – **Maurice R. Pearson, Wick, Caithness.**

*When I want to write an International Character, say £, I have to type [CTRL-O] 27 [CTRL-O] 23 to turn on the International Character Set and then [CTRL-O] * (where * is a number found in the back of the 1027 manual and produces an international character.)*

*I then turn off the ICS by typing [CTRL-O] 27 [CTRL-O] 24.*

*So the £ is written by typing [CTRL-O] 27 [CTRL-O] 23 [CTRL-O] 8 [CTRL-O] 27 [CTRL-O] 24 with no spaces between.*

*è is written by typing [CTRL-O] 27 [CRTL-O] 23 [CTRL-O] 20 [CTRL-O] 27 [CTRL-O] 24 with no spaces.*

## Accent on accents

*I HAVE an 800XL which I use with a 1050 disc drive, a 1027 printer and an AtariWriter disc. I find when printing lengthy reports occasionally the 1027 will stop in mid-sentence and apparently lock up.*

*I tried hitting Break and then P again, but all I got was "Device not available".*

*I contacted the Help-Line and was told that if I waited 4½ minutes all should be well, as it was just the 1027 re-inking.*

*I tried that, and lo-and-behold they were right. The 1027 started off again 4½ minutes later and completed the job.*

*My first query is this. As the 1027 doesn't make any move at all during the waiting time, what exactly is re-inking?*

*My second query is that when using the International Character Set the 1027 prints a small o with an accent in the left hand margin. This spoils reports incorporating German or French words. Is there any way of printing out the set without this appendage?*

*Incidentally congratulations on the magazine. I look forward to receiving it as much as I do my Norwich User Group's Nugget. I wish they were both weekly.* – **Bill Sibley, Wells-Next-the-Sea, Norfolk.**

● Well, we've never heard of it being called re-inking before, although we do know of the problem you refer to. It is basically a throwback to the types of printer which used to get very hot when used for long periods.

The computer simply pauses for a while to let the printer head cool down. This manifested itself in the old 400/800 series machines as a bug which repeated the last line of text after re-starting, which could be even more annoying.

As to your ó problem, this is caused by the fact that AtariWriter sends extra control codes after a carriage return, and can be avoided by turning the International Character Set off again after each special character is printed, and then on again before the next one.

Use [CTRL-O] 27 [CTRL-O] 23 to turn it on, and [CTRL-O] 27 [CTRL-O] 24 to turn it back off again.

## Database problem

*PLEASE explain in very simple terms how to run my Home Filing Manager on an 130XE using the extra memory.*

*I have an 800XL and unless I can use the extra RAM I can't see any advantage in having the 130XE.* – **J. Hopkins, Wisbech, Cambs.**

● Sorry but you can't, as it isn't designed to use it. Try Synfile+ for a database that can use 128k.

## Testing RAM

*COULD you please let me know if the 32k expansion RAM I have for my 600XL is faulty or does 32k + 16k add up to 40k on the 600XL? I only get 40 memory blocks when using the memory test.*

*Many games using 48k RAM like Colosuss Chess 3.0, F-15 Strike Eagle and Space Shuttle are OK, Solo Flight being the exception. Could I get this problem with Mercenary from Novagen?*

*Has anyone else had this problem with RAM add-ons?* – **P.J. Tappenden, Walton-on-Naze, Essex.**

● When you go from Basic to the self-test, Basic is still using up 8k of memory, so 40 blocks will be quite normal on the memory test.

To check the full 48k hold down Option while you switch on. This will disable Basic completely and take you straight into the self-test.

You will get exactly the same result on an 800XL or a 130XE, so don't worry about it. By the way, Mercenary should work fine on your upgraded 600XL, as, indeed, should Solo Flight.

## Saving pictures

*AFTER typing in the Canvas program from the October 1985* Atari User *I produced a very good picture of which I was very proud.*

*I thought I would try to save the picture, and that's where the problem started.*

*I pressed Break and while the picture was still on the screen typed NEW and 10 GR. 15+32.*

*Then I saved it on tape. I pressed Reset and typed NEW, and GR.15+32 would put the picture back on the screen.*

*But after the computer was switched off and on again I tried to load the picture but it was not there.*

*Could you please tell me how to save pictures like this?* – **Alan Pick, Cannock, Staffs.**

● Although you could still see the pictures on your screen this was only because you had not cleared the memory when you did the GRAPHICS 15+32 call.

Similarly, NEW and RESET do not clear the graphics area. Only a GRAPHICS command can do this, and by adding 32 you selected a version which retains the previous picture.

Once you turned off the computer all of the memory was wiped – including your picture. Unfortunately, the SAVE command will only save your program, not other areas of memory.

The fastest way to save the picture is by a machine code routine, but a simple Basic version is as follows:

To SAVE (while the picture is showing):

```
10000 REM SAVE GR.15 SCREEN TO DISK
10001 REM CHANGE LINE 10030 TO USE
      ADDR+7679 FOR A GR.31 SCREEN
      (IE: WITH NO TEXT WINDOW)
10010 OPEN #1,8,0,"D:FILENAME.EXT"
10020 ADDR=PEEK(88)+PEEK(89)*256
10030 FOR I=ADDR TO ADDR+6399
10040 PUT #1,PEEK(I)
10050 NEXT I
10060 CLOSE #1
```

To LOAD again, use:

```
20000 REM LOAD GR.15 SCREEN FROM DISK
20001 REM CHANGE LINE 10030 TO USE
      ADDR+7679 FOR A GR.31 SCREEN
      (IE: WITH NO TEXT WINDOW)
20010 OPEN #1,4,0,"D:FILENAME.EXT"
20020 ADDR=PEEK(88)+PEEK(89)*256
20030 FOR I=ADDR TO ADDR+6399
20040 GET #1,A:POKE I,A
20050 NEXT I
20060 CLOSE #1
```

Both of these could be added to the Canvas program if you want.

## Stereo connection

*HOW about some programs for the 130XE using more of the available memory?*

*Also, will my 130XE produce audio output at a level to drive my stereo?* – **Stewart Bowld, Evesham, Worcs.**

● To use your stereo connect a mono DIN plug from the Atari monitor port to one of the Aux In sockets.

***Take part in our wide-ranging Reader Survey, help to decide the kind of features you'll be reading in future issues of Atari User, and . . .***

## *Win yourself the revolutionary*

# PSION ORGANISER II




*Actual size when closed: $5\frac{3}{4}'' \times 3\frac{3}{4}'' \times 1\frac{1}{8}''$*

**ONE of the reasons for the outstanding success of *Atari User* has been our determination to reflect, as far as we possibly can, the interests of our readers. We do this by careful study of the letters that pour into our editorial office every day, and by talking to the many thousands of readers who visited us at the Atari show.**

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☑ 15-20 ☐ 30-40 ☐ Over 50

**How long have you been reading Atari User?**
☐ 0-3 months ☐ 3-6 months
☐ 6 months-1 year ☑ since issue 1

**How often do you buy Atari User?**
☑ every issue ☐ 1 in 3
☐ 1 in 2 ☐ less regularly

**If you play games, which of the following types do you enjoy most?**
☑ arcade
☐ strategy (eg chess, draughts)
☐ adventure
☐ simulators

**Which, if any, of the following modems do you own?**
☐ WS2000 ☐ Nightingale
☐ WS3000 ☐ Voyager
☐ WS3000 V22
☐ other ..........

**Which of the following baud rates do you use?**
☐ 300/300 ☐ 1200/1200
☐ 1200/75

**If you own a printer, is it:**
☑ dot matrix ☐ plotter
☐ thermal ☐ other ..........
☐ daisywheel

Please state manufacturer/type
ATARI 1029

**If you have a disc drive, is it:**
☐ 810 ☑ 1050
☐ other ..........

**Which pieces of hardware are you likely to buy over the next 6 months?**
☐ printer ☐ digitiser
☐ disc drive ☐ MIDI interface
☐ monitor ☐ plotter
☐ modem ☐ joystick
☐ cassette recorder ☐ other ..........

**Which of the above do you intend to buy eventually?**
..........

**How do you rate your knowledge of Basic programming?**
☐ Novice ☐ Experienced
☐ Intermediate ☐ Don't program

**If you attend a computer club, please give its name and town:**
..........

**How do you purchase products for your micro?**
☐ mail order
☑ high street shop
☐ exhibitions/shows
☐ Atari User special offers

**Do you plan to attend the next Atari Show?**
☑ Yes ☐ No

**Will your main interest be**
☑ new product launches
☑ bargain prices
☑ purchasing a particular product
☑ the wide range of products on view

**Where do you buy Atari User?**
☑ newsagent ☐ subscription
☐ computer dealer

**How many other people read your copy of Atari User?**
☐ 1 ☐ 3
☑ 2 ☐ more than 3

**Which other magazines do you read?**
☐ Antic ☐ Monitor
☐ Analog ☐ Computer Gamer
☐ Compute! ☐ C & VG
☑ Page 6 ☐ other ..........

**Which article, or series of articles, would you like Atari User to contain in forthcoming issues?**
..........

**Have you any general comments to make on the magazine contents?**
..........

## Atari 8-bit computer owners

**Which computer do you own?**
☐ 400 ☐ 1200XL
☐ 800 ☐ 130XE
☐ 600XL
☐ other 800XL

**What memory capacity has your computer?**
.......k

**Do you own an 850 interface?**
☐ Yes ☑ No

**Which of the following do you use?**
☑ Atari Writer ☐ Assembler Editor
☐ Paperclip ☐ Mac/65
☐ Homepak ☐ Action!
☐ Superscript ☐ Visicalc
☐ Logo ☐ Syncalc
☐ Basic XL/XE ☐ Synfile +
☐ Microsoft Basic

Please list any other non-game product you regularly use:
Speed script

## Atari ST owners

**Which computer do you own?**
☐ 520ST ☐ 1040STF
☑ 520STM

**Which peripherals do you own?**
☐ .5 mg drive ☐ hard disc
☐ 1 mg drive ☐ printer
☐ other ..........

**Do you have GEM/TOS:**
☐ on disc ☐ in ROM

**What kind of monitor do you use?**
☐ colour ☐ monitor/TV
☐ monochrome

**What do you mainly plan to use your ST for?**
☐ work ☐ programming
☐ personal/business ☐ games
☐ other ..........

**What languages do you use?**
☐ Basic ☐ Pascal
☐ Modula ☐ C
☐ other ..........

**List 3 software packages you regularly use:**
1 ..........
2 ..........
3 ..........

**Finally, by circling one number on each line, could you indicate your level of interest in the following articles (0 lowest – 9 highest)**

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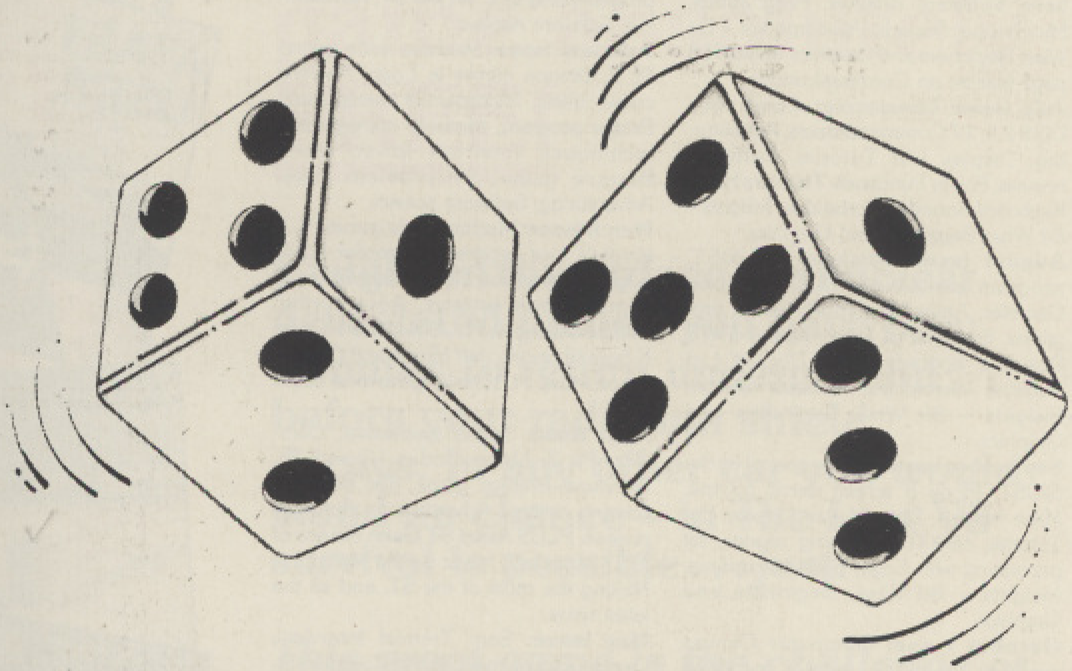
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START OF A NEW SERIES

**THIS month we start another series from the prolific pen of LEN GOLDING. Just how creative can you be if limited to only five lines of Basic program?**

**Len starts the ball rolling with this Dice program and we've got some more of his little beauties for future months. But if YOU would like to contribute just remember the title of the series . . .**

# Five liners!



**OUR first program simulates a die, displaying one of six possible faces after every roll.**

It's fun to watch and can be used by small children or handicapped youngsters who would have difficulty handling traditional dice. It also makes a good pre-school counting and shape-recognition game in its own right.

Packing everything into five lines is tricky. You can't simply generate random dots on the screen because only six of the possible combinations look like real dice faces.

This five-liner gets round the problem by storing the six legal patterns in an array then using a random number (0 to 5) as an index into it.

A die face has three columns and three rows, so we need nine bytes of information to store each legal pattern of dots and spaces. Six possible faces therefore require a total of 54 bytes.

There's no need to arrange them as 3 × 3 matrices in the computer's memory – a 54 × 1 array will do just as well and can be handled much more easily.

Line 10 switches the cursor off, clears the screen, sets up the array and puts the number 32 – blank space character – into every element. Then it opens the keyboard for input.

Line 20 holds the positions (4th, 9th, 17th, 20th and so on) where dot characters – CHR$(20) – are to be stored. If you drew the array out on graph paper you would see that each block of nine entries can be split into three sets of three, then arranged one under the other to form a die face.

Line 30 does nothing more than draw a box shape to contain the dots.

The POKE 764,1 command is there to fool the computer into thinking you've pressed a key. Without it your initial screen would just contain a rather enigmatic box with no dots in it.

Line 40 is where the main loop starts. It waits for any character key to be pressed, then generates two random numbers. The first is between five and 15 and determines how many times the die will roll before it settles.

The second ranges from 0 to 5 and determines which face will finally be displayed. This second number is multiplied by nine to find whereabouts in the array the chosen face pattern starts. Line 40 also produces a bleeping sound to accompany the pattern changes.

Line 50 retrieves the chosen nine bytes, chops them into three sets of three and prints each character – dot or space – at its correct position inside the box on screen.

```
10 POKE 752,1:? "K":DIM A(53):FOR X=0
TO 53:A(X)=32:NEXT X:FOR X=0 TO 20:REA
D D:A(D)=20:NEXT X:OPEN #1,4,0,"K:"
20 DATA 4,9,17,20,22,24,27,29,33,35,36
,38,40,42,44,45,47,48,50,51,53
30 POSITION 17,9:? "┌───┐":FOR X=10 TO
 12:POSITION 17,X:? "│   │":NEXT X:POS
ITION 17,13:? "└───┘":POKE 764,1
40 POSITION 13,22:? "PRESS ANY KEY":GE
T #1,A:FOR T=1 TO INT(RND(0)*10)+5:N=I
NT(RND(0)*6)*9:SOUND 0,T*3+N+10,10,8
50 FOR R=0 TO 2:FOR C=0 TO 2:POSITION
C+18,R+10:PRINT CHR$(A(N+R*3+C)):NEXT
C:NEXT R:NEXT T:SOUND 0,0,0,0:GOTO 40
```

**Get it right!**

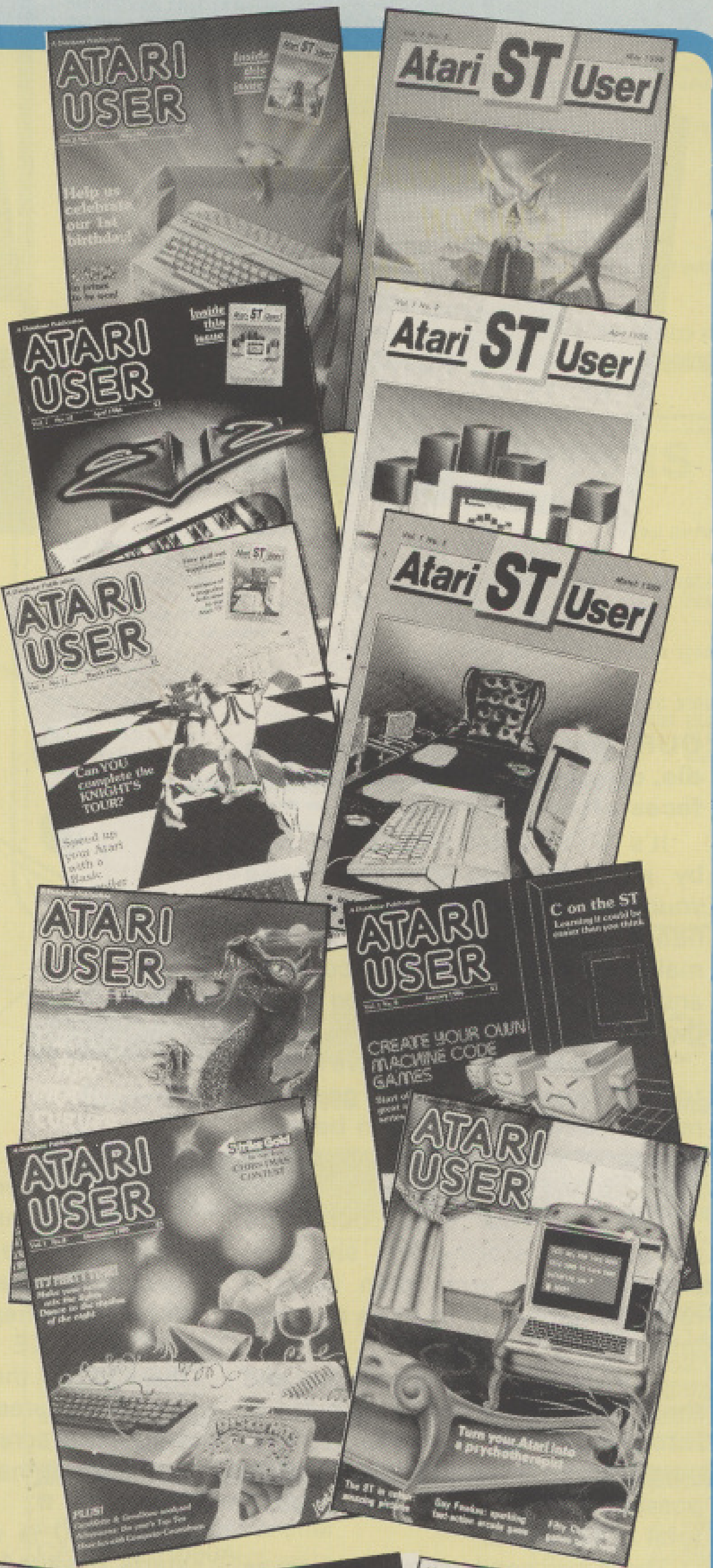
| LINE | CHSUM | LINE | CHSUM | LINE | CHSUM |
|---|---|---|---|---|---|
| 10 | 19110 | 20 | 9903 | 30 | 17249 |
| 40 | 19528 | 50 | 20732 | | |

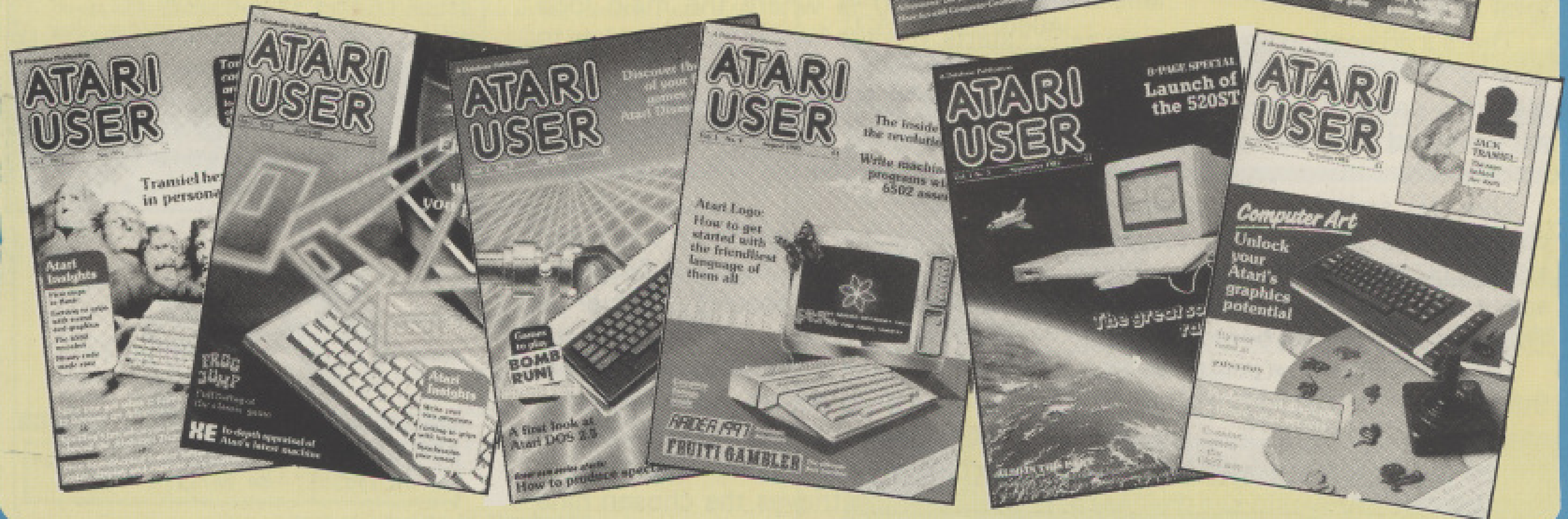
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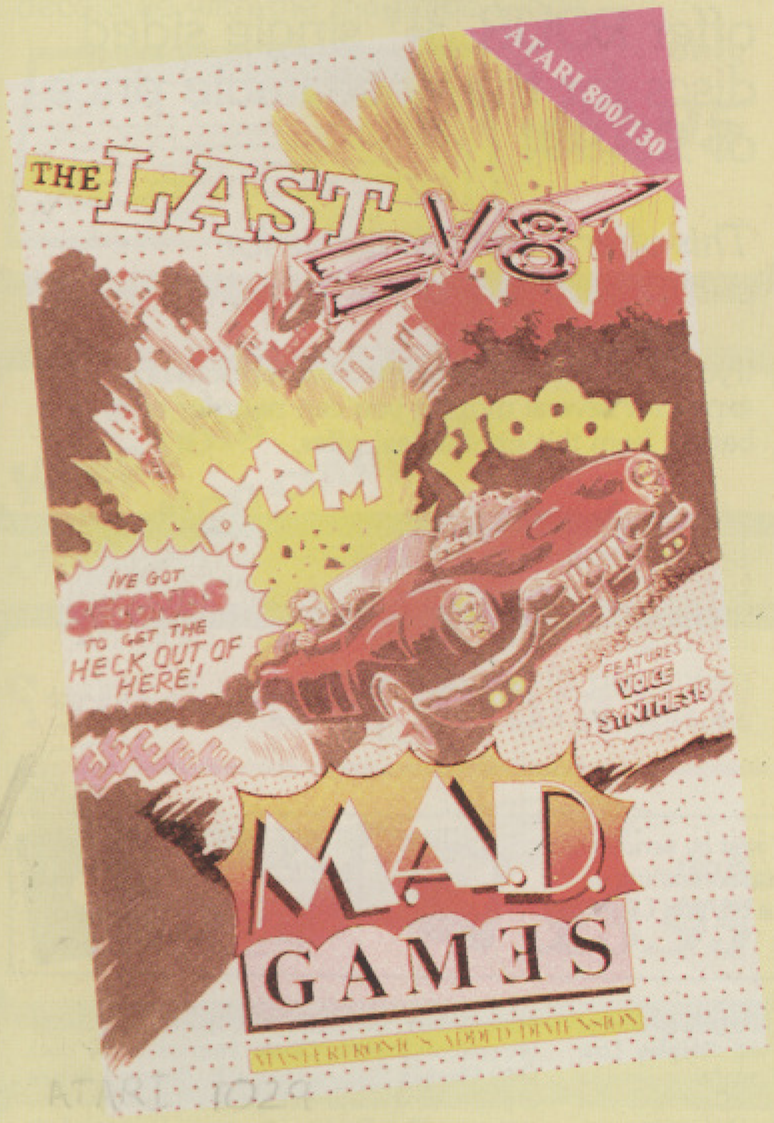
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**June issue:** Analysis of the 130XE, Submarine, Adventuring, Random numbers, Software reviews, Frog Jump, Microscope, Sounds, Atari Insights – Bit Wise, Beginners and Graphics, special 12 page feature on Communications.
**July issue:** Disassembler, Bomb Run, DOS 2.5, 17 Commandments, Adventuring, Display List Tutorial, Software reviews, Power Functions, Treasure Hunt, Keyboard Sounds, Microscope, Insights – Bit Wise, Beginners and Graphics.
**August issue:** Analysis of 520ST, program protection routines, Fruiti Gambler, Assembler, Touch Tablet programs, first look at Logo, Raider 1997, Dos 2.5 upgrade offer, Display List Tutorial, Microscope, Software reviews, Insights – Bit Wise, Beginners and Graphics.
**September issue:** 8-page special on the 520ST, Mode 8 screen dump routine, Maze Munch, Data Maker, Display List Tutorial, 68000 addressing modes, list processing with Logo, Software reviews, Insights – Bit Wise, Beginners and Graphics.
**October issue:** Computer Canvas graphics program, Updates for RAW 6502 assembler, 130XE Ram-disc utility, Hex/Ascii memory dump utility, Pontoon, Software reviews, 68000 operating environment, Wraptrap, Insights – Bit Wise, Beginners and Graphics.
**November issue:** Converse program, Bitwise operator utility, ST graphics examples, ST software list, Guy Fawkes game, Display List tutorial, Adventuring, Microscope, Software reviews, Insights – Bit Wise, Beginners and Graphics.
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**April issue:** Sound synthesiser, Compiler Pt. 2, Using modes 12 and 13, Mancuna strategy game, disc directory printing utility, Adventuring, Software reviews, PLUS **Atari ST User:** Review of TDI's Modula-2, music via the Midi ports, Making the most of the ST, and all the latest news.
**May issue:** Sam Tramiel Interview, Cavern Escape maze game, Compiler Pt. 3, Player Missile Graphics Pt. 1, Anna's Spelling Program, Adventuring, Software reviews, PLUS **Atari ST User:** Atari Show report, The Pawn and Disk Utilities reviewed, ST Graphics Pt. 1, DegastoNeoChrome Picture conversion program, Making the most of your ST, and the latest 8-bit and ST news from the States.

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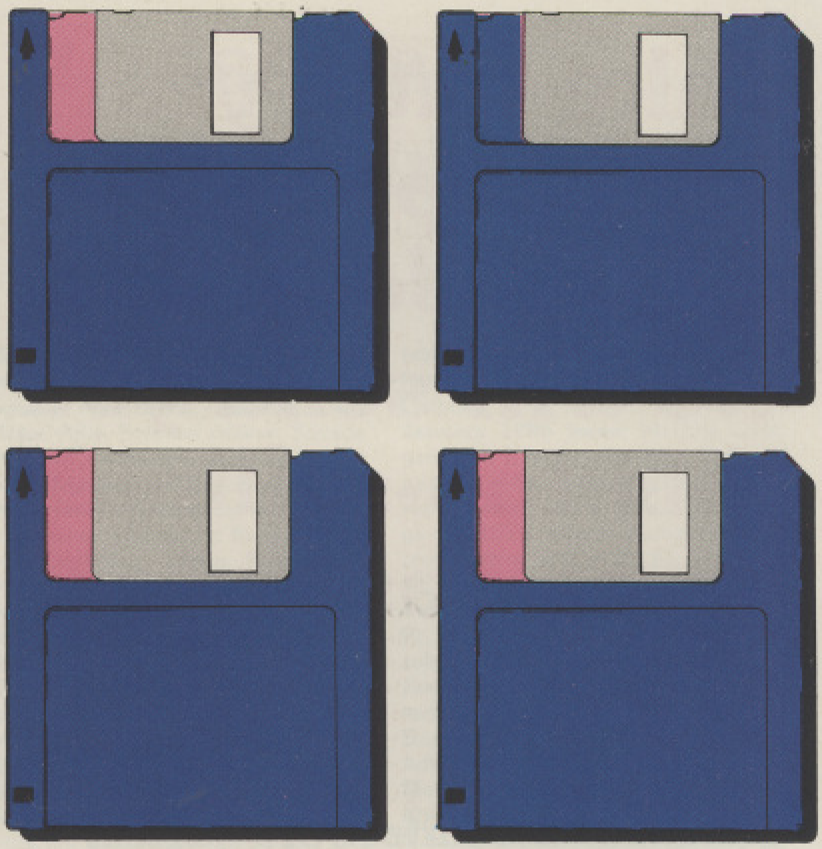
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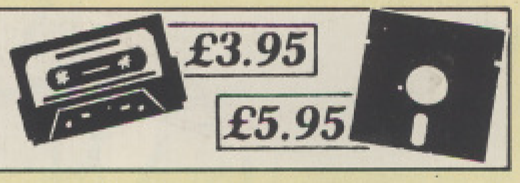
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**SEPTEMBER: Maze Munch:** Help Horace the Blob munch the maze monsters' morsels. **Data Maker:** Convert your machine code routines to DATA statements. **Display List:** Demonstration programs. **Screen Dumps:** Dump your Mode 8 screens to a 1029 printer. **Bricks:** Solve the Bricks problem.

**OCTOBER: Pontoon:** Twist? Bust! **Memory Dump:** Examine memory in hex and Ascii. **Display List:** Demonstration programs. **Wrap Trap:** Action game for one or two players. **Computer Canvas:** Make your own micro masterpiece. **Assembler Update:** Improvements for RAW assembler. **Ram Disc:** Make the most of the 130XE's extra memory.

**NOVEMBER: Guy Fawkes:** Help Guy escape from the guards. **Converse:** Teach your Atari to be a psychotherapist. **Display List:** Demonstration programs. **Bitwise Operators:** Utility to provide logical functions. **Circle:** Draw and fill a circle. ***Plus:*** Freebie of the month – **Creepshow** machine code pinball game.

**DECEMBER: Countdown:** Micro version of the famous TV game. **Get It Right!:** Atari User's own check-sum program. **Disco:** Son et lumière on your Atari. **List Utility:** Makes listing easier. **Display List:** Demonstration programs. ***Plus:*** Freebie of the month – **Jane's Program** machine code entertainment.

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**MARCH: Horse Play:** Knight's tour program. **Basic Compiler:** Program to accompany the new series. **Alien Attack:** Final part of assembly listing. ***Plus:*** Freebie of the month: **Winston in the Caves** – can you keep your head and help Winston find his?

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**MAY: Cavern Escape:** Can you help In-I-Go Joe escape from the labyrinths with King Muneebag's gold? **Player Missile:** Program to accompany the start of the series. **Spelling:** Automate those weekly school spelling tests.

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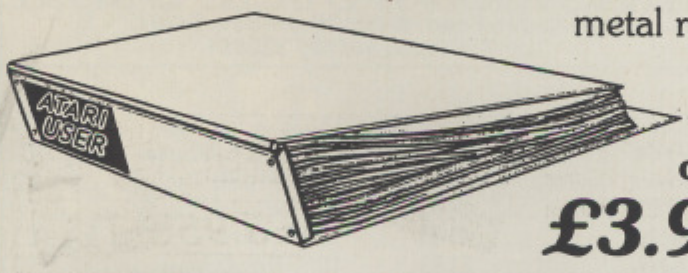
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